January 1977 Number 389-Part I

P-A STACKS

DEPARTMENT OF COMMERCE
FEB 24 1977
UNITED STATES OF AMERICA

Solar-Geophysical Data prompt reports

Data for December 1976–November 1976

Explanation of Data Reports Issued as Number 378 (Supplement) February 1976

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA SERVICE / ASHEVILLE, N.C.

U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Robert M. White. Administrator
ENVIRONMENTAL DATA SERVICE
Thomas S. Austin, Director

Solar - Geophysical Data

NO. 389 JANUARY 1977

Part I (Prompt Reports)

DATA FOR
DECEMBER 1976
NOVEMBER 1976

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

For obtaining bulletins on a data exchange basis, send request to: World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado 80302.

For sale through the National Climatic Center, Federal Building, Asheville, NC 28801, Attn: Publications. Subscription Price: $34.00 annually for both Part I (Prompt Reports) and Part II (Comprehensive Reports) or $18.00 annually for either part. Annual supplement containing explanation is included. For foreign mailing add $32.00 for both parts or $16.00 for either part. Single issue price $1.50 for either part and $1.40 for the extra issue. Make checks and money orders payable to: Department of Commerce, NOAA.

To standardize referencing these reports in the open literature, the following format is recommended:

Solar-Geophysical Data, 366 Part I (or Part II), pages, February 1975, U.S. Department of Commerce, (Boulder, Colorado, U.S.A. 80302)

SOLAR - GEOPHYSICAL DATA

No. 389

Issued in two parts

Hope I. Leighton, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

CONTENTS

Part I (Prompt Reports)

	Page
Index for 1975 and 1976	2
Data for December 1976	3-22
Data for November 1976	23-111

Part II (Comprehensive Reports)

Index for 1975 and 1976	2
Data for July 1976	3-16
Data for June 1976	17-26
Miscellaneous Data	27-34

Solar Wind - Imp 8 -- June 1976
Radio Emission - Spectral -- Culgoora
September and October 1976

INDEX FOR 1975 - 1976 DATA PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

		1975 Aug	Sep	Oct	Nov	Dec	1976 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
A.	Solar and Interplanetary Phenomena																	
A.1	Sunspot Drawings	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.2a	Zürich Provisional Relative Sunspot Numbers R_Z	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.2b	Zürich Final Sunspot Numbers R_Z	370A 6	371A 6	372A 6	373A 6	374A 6												
A.2c	American Relative Sunspot Numbers R_A'	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.3a	Mt. Wilson Magnetograms	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.3b	Mt. Wilson Magnetic Characteristics of Sunspots	374A 90	375A 84	376A 90	377A 86	378A 90	379A 88	380A 94	381A 92	382A 86	383A 88	384A 84	385A 88	386A 84	387A 86	388A 88	389A 86	
A.3c	Kitt Peak Magnetogram	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	---	---	---	---	386A 22	387A 26	388A 26	389A 26	
A.4	H_α Spectroheliograms	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.5	Calcium Plage Drawings - McMath (or Catania)	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.5a	Calcium Plage (McMath) and Sunspot Regions	374A 90	375A 84	376A 90	377A 86	378A 90	379A 88	380A 94	381A 92	382A 86	383A 88	384A 84	385A 88	386A 84	387A 86	388A 88	389A 86	
A.5b	McMath Daily Calcium Plage Indices	374A 95	375A 90	376A 96	377A 92	378A 96	379A 93	380A100	381A 97	382A 91	383A 94	384A 90	385A 93	386A 89	387A 93	388A 94	389A 90	
A.6	H_α Synoptic Charts	379B 14	380B 12	376A 27	377A 25	378A 27	379A 25	380A 33	381A 29	382A 25	383A 25	384A 23	385A 24	386A 20	387A 26	388A 26	389A 26	
A.7b	Coronal Line Emission	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.7f	Helium D3 Chromosphere (Big Bear)	---	---	---	---	---	378A 23	379A 21	380A 30	381A 24	382A 21	383A 21	384A 19	385A 21	---	387A 20	388A 21	389A 21
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.8g	Daily Values of Adjusted Solar Flux (AFGL)	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.9cb	8.6 cm Radio Maps of the Sun (MELC - La Posta)	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.9d	2 cm Radio Maps of the Sun (MELC - La Posta)	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.10a	169 MHz - Interferometric Observations (RamCay)	373A 15	374A 12	375A 12	376A 14	377A 12	378A 13	379A 12	380A 15	381A 13	382A 12	383A 13	384A 12	---	386A 12	387A 12	388A 12	389A 12
A.10c	21 cm East-West Solar Scans (Fleurs)	373A 17	374A 14	375A 14	376A 16	378B 57	378A 15	379A 14	380A 17	381A 15	382A 14	383A 15	384A 14	385A 14	387A101	388A101	388A 14	389A 14
A.10d	43 cm East-West Solar Scans (Fleurs)	373A 18	374A 15	375A 15	376A 17	378B 58	378A 16	379A 15	380A 18	381A 16	382A 15	383A 16	384A 15	385A 15	387A102	388A102	388A 15	389A 15
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	373A 16	374A 13	375A 13	376A 15	377A 13	378A 14	379A 13	380A 16	381A 14	382A 13	383A 14	384A 13	385A 13	386A 13	387A 13	388A 13	389A 13
A.11g	Solar X-ray (SMS/GOES)	373A 25	374A 20	375A 18	376A 21	377A 19	378A 20	379A 19	380A 26	381A 21	382A 18	383A 19	384A 17	385A 18	386A 16	387A 18	388A 19	389A 18
A.11h	Solar X-ray (OSO-8; 1975-057A)	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.11tb	Solar EUV Spectroheliograms FeXV 284Å (AURA D2-8)	---	---	---	---	---	---	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	---	374A 18	---	---	377A 18	---	---	---	---	---	---	---	---	---	386A 19	387A 16	388A 18	---
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	---	374A 19	---	---	---	---	---	---	---	---	---	---	---	---	---	387A 17	---	---
A.12e	Energetic Solar Particles (IMP H & J)	380B 23	381B 39	382B 29	382B 35	382B 12	383B 17	384B 10	385B 16	386B 20	387B 16	388B 15	389B 12						
A.13a	Solar Wind (Pioneers 6 & 7)	---	374A 18	---	---	377A 18	378A 19	379A 18	---	---	---	---	---	---	---	386A 15	387A 16	388A 18	---
A.13d	Solar Wind from IPS Measurements	373A 24	374A 17	375A 17	376A 20	377A 17	378A 18	380A123	380A 25	381A 20	382A 17	383A 18					387A 15	388A 17	389A 17
A.13e	Solar Plasma (IMP H & J)	380B 22	381B 38	382B 28	382B 34	383B 39	383B 16	384B 9	385B 15	387B 36	387B 15	388B 14	389B 11						
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	374A 19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
A.17	Interplanetary Magnetic Field (Pioneer 9)	---	374A 19	---	---	---	---	---	---	---	---	---	---	---	---	387A 17	---	---	---
A.17c	Inferred IP Magnetic Field	373A 29	374A 23	375A 20	376A 24	377A 21	378A 24	379A 22	380A 31	381A 25	382A 22	383A 22	384A 20	385A 22	386A 18	387A 21	388A 22	389A 22
A.18	Interplanetary Electric Field (Pioneer 8)	---	374A 19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
A.18	Interplanetary Electric Field (Pioneer 9)	---	374A 19	---	---	---	---	---	---	---	---	---	---	---	---	387A 17	---	---	---
B.	Ionospheric (and Radio Wave Propagation) Phenomena																	
B.51c	High Latitude Quality Figures and Forecasts	374A115	375A103	376A113	377A111	378A114	379A115	380A119	381A126	382A113	383A118	384A108	385A113	386A111	387A115	---	---	
B.52	Graphs of Transmission Frequency Range	374A116	375A104	376A114	377A112	378A115	379A116	380A120	381A127	382A114	383A120	384A110	385A114	386A112	387A116	388A116	389A110	
B.53	Quality Figures Based on Frequency Ranges	374A118	375A106	376A116	377A114	378A117	379A118	380A122	381A129	382A116	383A119	384A109	385A116	386A114	387A118	388A118	389A109	
C.	Flare-Associated Events																	
C.1a	Optical Observations Flares	373A 10	374A 20	375A 10	376A 10	377A 10	378A 10	379A 10	380A 10	381A 10	382A 10	383A 10	384A 10	385A 10	386A 10	387A 10	388A 10	389A 10
C.1ba	Optical Observations Flares (Standardized Data)	370B 4	379B 4	380B 4	381B 4	382B 4	383B 4	384B 4	385B 4	386B 7	387B 6	388B 6	389B 6						
C.1d	Flare Patrol Observations	373A 14	374A 11	375A 11	376A 13	377A 11	378A 12	379A 11	380A 14	381A 12	382A 11	383A 12	384A 11	385A 11	386A 11	387A 11	388A 11	389A 11
C.1d	Flare Patrol Observations	370B 25	379B 8	380B 7	381B 13	382B 8	383B 10	384B 7	385B 14	386B 12	387B 10	388B 11	389B 9						
C.1e	Flare Indices (by day)	373B 24	379B 7	380B 6	381B 12	382B 7	383B 9	384B 6	385B 13	386B 11	387B 9	388B 10	389B 8						
C.1f	Flare Indices (by Region)	379B 22	380B 20	381B 36	382B 26	383B 32	384B 24	385B 56	386B 34	387B 30	388B 30	389B 26							
C.3	Solar Radio Waves - Outstanding Occurrences	378B 26	379B 9	380B 8	381B 14	382B 9	383B 11	384B 8	385B 15	386B 13	387B 11	388B 12	389B 10						
	Solar Radio Waves - Fixed Frequencies - Selected	373A 19	374A 16	375A 16	376A 18	377A 16	378A 17	379A 16	380A 19	381A 17	382A 16	383A 17	384A 16	385A 16	386A 14	387A 14	388A 16	389A
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	374A107	376B 26	376A105	377A102	378A101	379A102	380A106	381A114	383B 37	383A103	385B 60	385A100						
C.4a	Solar Radio Spectral Obs. (Fort Davis)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	380A102	381A100	382A 93	383A 96	384A 92	385A 95	386A 91	387A 95	388A 96	389A 92	
C.4b	Solar Radio Spectral Obs. (Boulder)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	380A102	381A100	382A 93	383A 96	384A 92	---	---	---	---	---	---	---
C.4d	Solar Radio Spectral Obs. (Culgoora)	378B 54	376B 24	376A 98	377A 94	378A 96	379A 95	380A102	381A100	383B 34	383A 96	385B 58	385A 95	387B 32	389B 29	389B 32	389A 92	
C.4e	Solar Radio Spectral Obs. (Weissenau)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	380A102	381A100	382A 93	383A 96	384A 92	385A 95	386A 91	387A 95	388A 96	389A 92	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	381B 45	381A100	382A 93	383A 96	384A 92	385A 95	386A 91	387A 95	388A 96	389A 92	
C.4h	Solar Radio Spectral Obs. (Dwingeloo)	---	---	---	376A 98	---	379A 95	---	381A100	382A 93	383A 96	384A 92	---	386A 91	387A 95	388A 96	389A 92	
C.4i	Solar Radio Spectral Obs. (Bärnten)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	380A102	381A100	382A 93	383A 96	384A 92	385A 95	386A 91	387A 95	388A 96	389A 92	
C.4j	Solar Radio Spectral Obs. (Mantla)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	381B 45	381A100	382A 93	383A 96	384A 92	385A 95	385A 91	387A 95	388A 96	389A 92	
C.5e	Solar X-ray (SMS/GOES)	373A 27	374A 22	375A 18	376A 23	377A 23	378A 22	---	380A 28	381A 23	382A 20	---	---	385A 20	---	---	---		386A 20
C.6	Sudden Ionospheric Disturbances	374A 96	375A 91	376A 97	377A 93	378A 95	379A 94	380A101	381A 98	382A 92	383A 95	384A 91	385A 94	386A 90	387A 94	388A 95	389A 91	
D.	Geomagnetic and Magnetospheric Phenomena																	
D.1a	Geomagnetic Indices Kp, Kn, Ks, Km, Ap, aa, Cp	374A110	374A 98	376A108	377A105	378A105	379A108	380A112	381A119	382A106	383A111	385B 61	385A106	386A104	387A108	388A108	389A102	
D.1ba	27-day Chart of Kp Indices	374A111	374A 99	376A109	377A106	378A107	379A109	380A114	381A121	382A108	383A113	384A103	385A108	386A106	387A110	388A110	389A104	
D.1c	27-Day Chart of Cp	374A112	378A108	378A108	378A108	378A108												
D.1d	Principal Magnetic Storms	374A113	374A101	376A111	377A108	378A112	379A113	380A117	381A124	382A111	383A116	384A106	385A111	386A109	387A113	388A113	389A107	
D.1e	Reduced Magnetograms	---	---	381B 47	382B 40	---	---	---	---	---								
D.1f	Sudden Commencement and Solar Flare Effects	374A114	374A102	376A112	377A110	378A113	379A114	380A118	381A125	382A112	383A117	384A107	385A112	386A110	387A114	388A114	389A108	
D.1g	Equatorial Indices Dst	374A112	374A100	376A110	377A107	378A111	379A112	380A116	381A123	382A110	383A115	384A105	385A110	386A108	387A112	388A112	389A106	
F.	Cosmic Rays																	
F.1a	Cosmic Ray Neutron Counts (Deep River)	374A108	375A 96	377B 34	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1b	Cosmic Ray Neutron Counts (Climax)	374A108	375A 96	376A106	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1d	Cosmic Ray Neutron Counts (Alert)	374A108	375A 96	377B 34	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1f	Cosmic Ray Neutron Counts (Calgary)	374A108	375A 96	376A106	377A103	378A104	380B 28	381B 44	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)	374A108	375A 96	376A106	377A103	378A104	380B 28	381B 44	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1h	Cosmic Ray Neutron Counts (Thule)	374A108	375A 96	376A106	377A103	378A104	379A103	380A107	381A118	383B 38	383A104	---	---	---	---	---	---	
F.1i	Cosmic Ray Neutron Counts (Kiel)	374A108	375A 96	376A106	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1j	Cosmic Ray Neutron Counts (Tokyo)	374A108	375A 96	376A106	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
H.	Miscellaneous																	
H.60	IUWDS Alert Decisions	373A 4	374A 4	375A 5	376A 5	377A 5	378A 5	379A 5	380A 4	381A 4	382A 4	383A 5	384A 5	386A 5	386A 5	387A 4	388A 5	389A 4
H.62	Abbreviated Calendar Record	379B 15	380B 13	381B 29	382B 19	383B 25	384B 17	385B 49	386B 27	387B 23	388B 23	389B 19						

Note: A = Part I, B = Part II.

374A 28 listed under 1975 Aug shows that data for August 1975 were contained in *Solar-Geophysical Data* Number 374 - Part I beginning on page 28.

DECEMBER 1976 DATA

Contents

	Page
Alert Period	
IUWDS Alert Periods (Advance and Worldwide)	4-5
Daily Solar Indices	
12-Month Tables Sunspot Numbers, R_z, and 2800 MHz Flux Adjusted to 1 A.U.	6
Combined Table Sunspot Numbers and Solar Fluxes	7
Graph of Sunspot Cycles	8
Zürich Smoothed Observed and Predicted Sunspot Numbers	9
Solar Flares	
Hα Solar Flares	10
No-Flare-Patrol Chart	11
Solar Radio Waves	
169 MHz Solar Interferometric Chart - Nancay	12
10.7 cm East-West Solar Scans - ARO, Ottawa	13
21 cm East-West Solar Scans - Fleurs	14
43 cm East-West Solar Scans - Fleurs	15
Selected Fixed-Frequency Occurrences	16
Solar Wind Measurements	
Scintillation Observations	17
Spacecraft Observations	
No observations	
Solar X-ray Radiation	
SMS-2 GOES	18-20
Coronal Holes	
Helium D3 Chromosphere	21
Inferred IP Magnetic Field Polarities	22

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

DECEMBER 1976

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	Active Regions: No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
336	1	30	00	72	07	-	-	-	-		1	SPOTNIL		SOLQUIET MAGQUIET
337	2	1	00	72	04	-	-	-	-		2	SPOTNIL		SOLQUIET MAGQUIET
338	3	2	00	74	04	-	-	-	-		3	SPOTNIL		SOLQUIET MAGQUIET
339	4	3	00	73	02	-	-	-	-		4	SPOTNIL		SOLQUIET MAGQUIET
340	5	4	00	73	09	-	-	-	-		5	SPOTNIL		SOLQUIET MAGQUIET
341	6	5	00	72	04	-	-	-	-		6	SPOTNIL		SOLQUIET MAGALERT 07/10
342	7	6	00	72	03	-	-	-	-		7	SPOTNIL		SOLQUIET MAGALERT MINOR RECURRENCE 07/11
343	8	7	11	72	09	N08E50	0	0	0		8	N08E50	Q	SOLQUIET MAGALERT MINOR RECURRENCE 08/11
344	9	8	33	73	20	N08E34 N24E02	2 0	0 0	0 0		9	N08E34 N24E02	E Q	SOLQUIET MAGALERT MINOR RECURRENCE 08/11
345	10	9	20	77	23	N07E19	5	0	0		10	N07E19	E	SOLQUIET MAGALERT 10/11
346	11	10	28	79	11	N06E06	2	0	0		11	N06E06	Q	SOLQUIET MAGALERT MINOR 11
347	12	11	25	81	12	N06W08	0	0	0		12	N06W08	Q	SOLQUIET MAGNIL
348	13	12	18	81	10	N06W19	0	0	0		13	N06W19	Q	SOLQUIET MAGQUIET
349	14	13	27	81	07	N06W32 S25W02	0 0	0 0	0 0		14	N06W32 S25W02	Q Q	SOLQUIET MAGQUIET
350	15	14	59	84	05	N06W46 S26W12 N12E76	1 0 0	0 0 0	0 0 0		15	N06W46 S26W12 N12E76	E E Q	SOLALERT PIANO 15 MAGQUIET
351	16	15	66	82	03	N06W60 S26W26 N12E61 S27E62	1 0 0 0	0 0 0 0	0 0 0 0		16	N06W60 S26W26 N12E61 S27E62	E Q Q Q	SOLNIL MAGQUIET
352	17	16	48	80	08	N06W73 S26W39 N12E47 S27E48	0 0 0 0	0 0 0 0	0 0 0 0		17	N06W73 S26W39 N12E47 S27E48	Q Q Q Q	SOLQUIET MAGQUIET STRATWARM ALERT /FRIDAY/ SIGNIFICANT TEMPERATURE INCREASES IN MID AND UPPER STRATOSPHERE OVER NORTHEAST ASIA AND EUROPE. PERSISTING STRONG WAVE TWO CIRCULATION PATTERN SUGGESTS FURTHER DEVELOPMENTS POSSIBLE WITHIN 2 TO 3 WEEKS.
353	18	17	51	78	06	N05W89 S26W52 N12E33 S27E34	0 0 0 0	0 0 0 0	0 0 0 0		18	N05W89 S26W52 N12E33 S27E34	Q Q Q Q	SOLQUIET MAGQUIET
354	19	18	23	76	09	S26W66 N12E19	0 0	0 0	0 0		19	S26W66 N12E19	Q Q	SOLQUIET MAGQUIET
355	20	19	22	75	06	S26W83 N12E06	0 0	0 0	0 0		20	S26W83 N12E06	Q Q	SOLQUIET MAGQUIET
356	21	20	22	74	03	N11W07 S26W91	0 0	0 0	0 0		21	N11W07 N26W91	Q Q	SOLQUIET MAGQUIET
357	22	21	14	74	04	N11W18	0	0	0		22	N11W18	Q	SOLQUIET MAGQUIET
358	23	22	11	76	09	N11W32	0	0	0		23	N11W32	Q	SOLQUIET MAGQUIET
359	24	23	11	76	06	N11W46	0	0	0		24	N11W46	Q	SOLQUIET MAGQUIET STRATWARM ALERT /FRIDAY/ STRATWARM WHICH DEVELOPED IN MID DECEMBER HAS SIGNIFICANTLY AFFECTED MID STRATOSPHERE TEMPERATURE AND CIRCULATION OVER ALASKAN SIBERIAN ARCTIC WITH UPPER STRATOSPHERE WARMING BY MORE THAN 40 DEG OVER ARCTIC EURASIA. FURTHER DEVELOPMENTS MAY LEAD TO 10 MB POLAR CIRCULATION REVERSAL BY END OF DECEMBER.
360	25	24	24	77	04	N12W58 S19E77	0 0	0 0	0 0		25	N12W58 S19E77	Q Q	SOLQUIET MAGQUIET
361	26	25	26	78	08	N11W71 S20E64	0 0	0 0	0 0		26	N11W71 S20E64	Q Q	SOLQUIET MAGQUIET
362	27	26	33	78	06	N11W87 S20E49	0 0	0 0	0 0		27	N11W87 S20E49	Q Q	SOLQUIET MAGQUIET

GENERAL BOOKBINDING CO.
77 495AA 2 013 1 C
QUALITY CONTROL MARK

2100 5 Dec 76

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

DECEMBER 1976

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions				Outstanding events	Forecasts			Alert Situations
						Location	No. of Flares				Date	Location	Desc*	
						Lat-Long	Total	M	X			Lat-Long		
363	28	27	19	78	05	S20E33	0	0	0		28	S20E33	Q	SOLQUIET MAGQUIET STRATWARM ALERT /TUESDAY/ STRATWARM EXISTS. RECENT MID STRATOSPHERE TEMPERATURE INCREASES OVER EUROPE ASSOCIATED WITH DEVELOPING RIDGING OVER ATLANTIC AND STRONG ANTICYCLONE OVER SIBERIAN ALASKAN ARCTIC SUGGEST POLAR CIRCULATION REVERSAL LIKELY DURING NEXT WEEK.
364	29	28	17	77	06	S20E20	1	0	0		29	S20E20	E	SOLQUIET MAGQUIET STRATWARM ALERT /WEDNESDAY/ STRATWARM EXISTS IN MID STRATOSPHERE CENTERED OVER EUROPE
365	30	29	23	77	39	S21E11	1	0	0		30	S21E11	E	SOLQUIET MAGQUIET STRATWARM ALERT /THURSDAY/ STRATWARM EXISTS OVER NORTHERN EURASIA.
366	31	30	33	78	12	S20W03	1	0	0		31	S20W03	E	SOLQUIET MAGALERT STRATWARM ALERT /FRIDAY/ STRATWARM EXISTS OVER NORTHERN EURASIA.
001	1	31	16	79	09	S19W20	2	0	0		1	S19W20	E	SOLQUIET MAGNIL

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare

RELATIVE SUNSPOT NUMBERS

ZURICH, R_z

1976 PROVISIONAL

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0	0	0	26	35	0	9	10	17	31	7	0
2	0	0	0	25	26	0	8	18	20	28	0	0
3	0	0	0	22	25	0	14	19	12	30	0	0
4	0	0	0	13	8	0	8	14	11	32	0	0
5	0	0	0	12	22	0	6	17	17	25	0	0
6	0	0	10	9	10	0	10	15	10	24	0	0
7	0	0	12	0	14	0	7	26	9	30	0	0
8	0	0	7	0	9	11	0	30	9	7	0	20
9	0	0	10	8	8	10	0	31	18	14	0	25
10	0	0	12	10	10	7	0	24	22	0	0	16
11	0	0	13	15	16	7	0	22	24	0	0	24
12	20	0	13	17	17	8	0	29	20	14	0	16
13	26	13	14	17	23	8	0	27	12	17	0	12
14	36	16	22	19	30	15	0	16	10	25	0	34
15	29	19	10	19	17	16	0	8	16	27	7	34
16	22	11	11	19	12	12	0	15	14	32	7	39
17	24	8	30	24	16	10	0	19	8	36	14	34
18	28	15	45	27	8	24	0	23	8	28	20	19
19	19	10	51	27	20	23	0	25	7	21	13	16
20	16	12	51	33	20	17	0	19	0	23	12	8
21	11	8	46	39	14	30	0	17	0	15	8	9
22	10	7	36	29	7	31	0	9	0	19	13	9
23	10	0	28	17	15	23	0	9	7	34	11	9
24	6	7	25	16	8	26	0	17	7	33	10	17
25	0	0	22	17	0	19	0	9	16	32	9	20
26	0	0	42	28	7	19	0	14	17	38	9	25
27	7	7	46	23	0	9	0	7	16	26	8	16
28	0	0	50	21	0	16	0	8	16	21	8	16
29	14	8	42	26	0	11	0	9	25	17	8	19
30	8		32	38	0	10	0	10	31	9	0	19
31	0		27		0		0	9		3		11
MEAN	8.5	4.0	23.0	19.5	12.7	12.4	2.1	16.9	13.4	21.8	5.5	15.0

1975 yearly mean = 15.5

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

1976

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	72.1	68.6	67.7	79.6	77.6	68.4	69.3	75.9	76.3	74.6	70.9	70.2
2	71.2	68.6	68.1	78.8	74.2	67.9	69.1	77.8	75.3	73.9	69.1	71.6
3	71.3	68.4	67.4	76.1	71.3	68.1	69.5	82.3	75.7	73.4	69.8	71.2
4	71.8	68.4	67.4	74.7	71.5	69.4	68.8	82.3	75.9	73.1	69.9	71.3
5	71.9	67.6	67.0	73.0	71.1	68.7	69.5	84.2	75.4	74.3	70.9	73.1
6	71.7	68.1	67.2	71.3	69.9	69.3	69.6	84.3	73.1	74.7	69.7	70.1
7	71.6	69.3	67.9	70.3	70.3	69.8	69.5	83.7	73.0	74.5	69.5	69.7
8	70.9	69.4	67.9	71.9	70.2	70.7	69.7	82.0	72.9	74.6	69.3	70.8
9	69.4	68.3	68.2	74.1	70.6	70.1	69.7	82.8	73.2	74.8	70.7	74.3
10	70.5	68.5	68.4	75.3	71.7	71.0	70.1	82.8	75.8	74.9	69.4	76.8
11	72.1	68.4	68.8	77.1	72.5	71.4	70.2	80.4	75.7	73.7	70.5	79.3
12	76.9	67.3	69.9	78.1	72.6	71.7	69.8	80.6	75.7	73.3	70.8	78.6
13	80.0	69.7	72.9	79.6	73.6	72.3	69.8	78.7	74.3	72.6	69.4	78.1
14	82.1*	69.9	78.1	79.5	74.2	73.7	70.7	73.4	74.7	74.4	69.2	81.0
15	80.4	69.6	69.1	79.2	76.3	74.3	71.4	72.8	73.9	75.5	71.1	79.8
16	79.1	69.7	72.5	80.6	73.2	77.1	69.6	72.9	75.8	77.3	71.1	77.8
17	76.6	69.9	74.4*	80.5	76.5	77.1	69.4	77.8	76.5	78.3	72.8	75.5
18	76.7	70.1	79.0	80.5	75.0*	77.9	70.6	78.2	74.3	77.3	75.6	73.8
19	75.2	70.1	81.6*	79.6	73.8	76.9	70.2	76.1	73.3	76.6*	74.6*	72.9
20	74.6	70.0	85.0	80.0	73.3	76.9	69.4	74.5	72.2	75.8	72.9	71.7
21	72.1	68.8	91.2	78.6	74.3	77.7	70.1	73.2	76.9	73.5	73.2	71.8
22	73.9	68.9	83.3	76.2*	72.5	78.9	70.1	72.3	76.5	75.4	73.3	73.4
23	76.2	69.2	86.9	75.7	71.9	76.5	68.7	70.8	72.3	80.1	72.5	73.7
24	68.5	69.6	82.6*	76.8	70.3	75.2	69.4	70.9	72.5	80.1	72.9	74.2
25	68.2	68.4	85.1	75.7	69.3	74.9	68.8	70.6	73.4	84.7	72.7	75.6
26	68.2	68.5	84.1*	75.7	69.3	74.3	68.5	70.1	72.8	80.4	72.1	75.6
27	67.2	68.5	85.5	74.6	69.0	72.8	69.4	71.5	73.3	77.4	73.7	75.2
28	67.1	67.9	87.1*	73.4	69.3	71.9	69.4	72.8	73.6	73.8	71.7	74.5
29	67.4	67.4	89.3	73.6	68.3	71.3	69.4	73.3	71.9	72.1	69.7	74.8
30	66.9		82.4	73.5*	68.1	70.3	70.7	73.0	72.6	72.1	69.7	75.1
31	69.1		82.7		68.7		72.3	73.8		70.4		76.4
MEAN	72.4	68.8	75.8	76.7	72.2	72.8	69.8	76.6	73.9	75.4	71.3	74.3

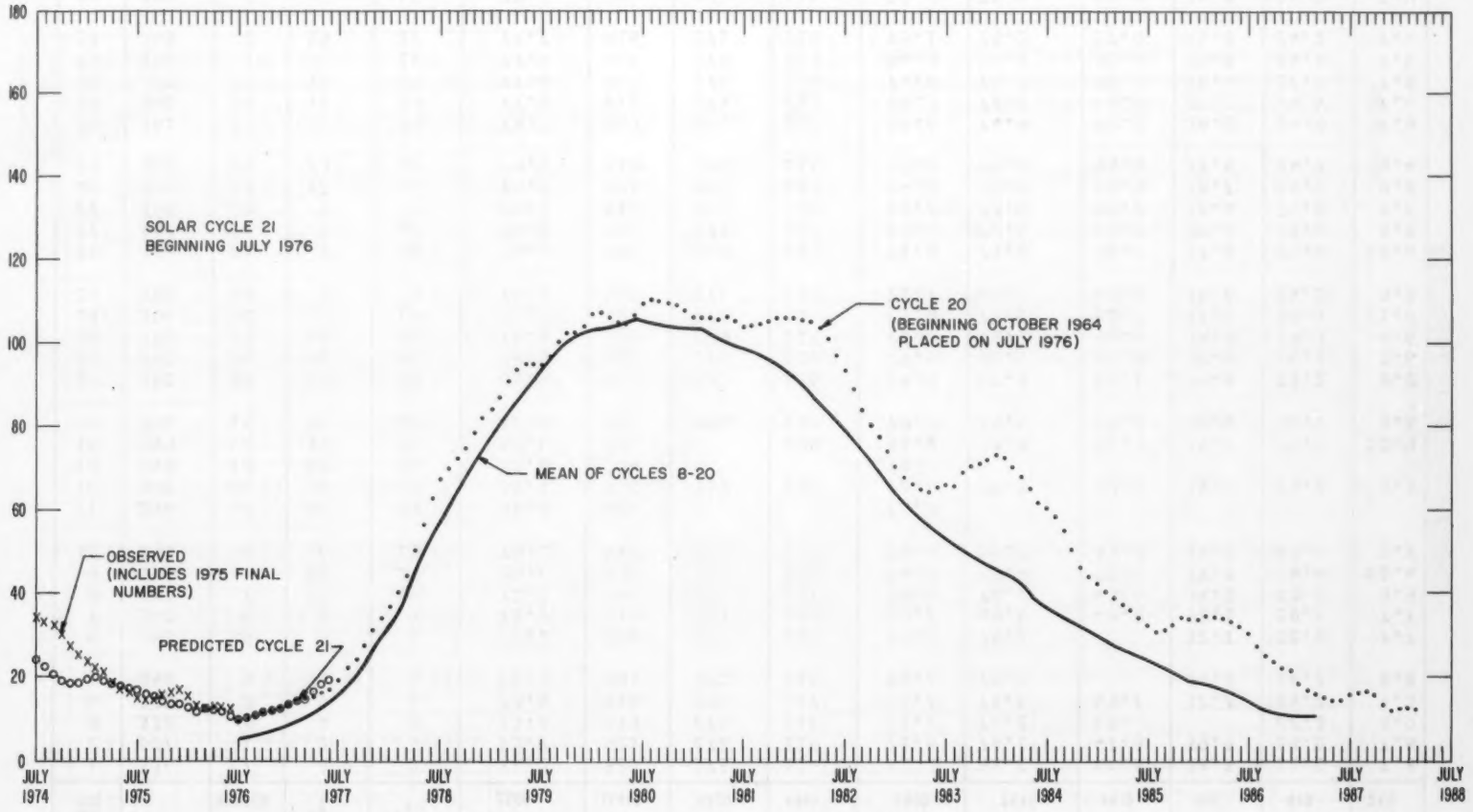
* adjusted for burst

DAILY SOLAR INDICES

DECEMBER 1976

DEC 1976	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$	OTTAWA 2800	AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	336	27	0	0	72.2	523	272	114	70.2	68.2	46.6	38.7	21.9	7.8
2	337	1	0	0	73.7	521	276	115	71.6	70.1	47.9	39.5	23.0	7.8
3	338	2	0	0	73.3	519	276	117	71.2	71.2	48.5		22.0	8.0
4	339	3	0	0	73.4	516	281	117	71.3	71.0	49.7	32.3	24.0	8.0
5	340	4	0	0	72.2	521	271	115	70.1	70.3		34.2	22.7	8.0
6	341	5	0	0	72.2	525	275	113	70.1	70.2		32.1	22.6	7.7
7	342	6	0	2	71.9	514	270	113	69.7	69.5	48.9	32.1	20.8	7.7
8	343	7	20	19	73.0	528	271	111	70.8	70.1	49.6	34.2	23.1	9.9
9	344	8	25	20	76.6	520	270	115	74.3	73.4	51.6	35.3	24.4	10.4
10	345	9	16	19	79.2	517	276	117	76.8	75.7	52.3	34.7	25.8	9.2
11	346	10	24	19	80.8	514			78.3					
12	347	11	16	18	81.1	526	269	118	78.6	77.3	53.5	34.1	20.2	8.3
13	348	12	12	14	80.6	534			78.1					
14	349	13	34	30	83.6	521		120	81.0	78.8	54.9	34.7	25.7	13.9
15	350	14	34	36	82.4	526	276	118	79.8	79.4	53.0	38.0	22.6	9.8
16	351	15	39	29	80.4	516	272	116	77.8	77.0	54.1	38.5	23.2	9.2
17	352	16	34	31	78.3	525	275	120	75.5	76.6	53.0	32.8	18.8	9.6
18	353	17	18	22	76.2	518	279	117	73.8	72.6	49.4	38.9	19.3	9.6
19	354	18	16	19	75.3	520	279	115	72.9	72.1	50.7	37.0	25.3	11.0
20	355	19	8	9	74.1	513	271	112	71.7	69.1	49.5	36.6	24.2	9.3
21	356	20	9	10	74.2	535	269	117	71.8	71.2	50.5	37.6	25.6	10.6
22	357	21	9	11	75.8	528	273	117	73.4	72.2	50.3	38.3	23.0	8.8
23	358	22	9	9	76.2	514	270	117	73.7	73.4	49.2	38.1	24.8	8.7
24	359	23	17	17	76.7	521	268	117	74.2	73.0	48.4	38.7	20.0	9.2
25	360	24	20	24	78.2	519	270	118	75.6	73.5	51.0	37.6	24.7	9.4
26	361	25	25	29	78.2	519	271	120	75.6	74.9	52.1	36.2	24.9	7.9
27	362	26	16	19	77.8	518	273	112	75.2	75.2	49.5	37.1	24.4	7.4
28	363	27	16	19	77.0	518	272	116	74.5	74.5	52.8	38.4	27.7	7.5
29	364	1	19	20	77.4	517	272	119	74.8	74.1	53.9	39.8	24.1	7.4
30	365	2	19	22	77.7	518	271	115	75.1	75.2	57.0	41.3	24.0	7.4
31	366	3	11	15	79.0	520	272	115	76.4	75.0	53.3	39.8	21.6	7.0
MEAN			15.0	15.5	76.7	521	273	116	74.3	73.3	51.2	36.7	23.3	8.8

* Adjusted for burst.



PREDICTED AND OBSERVED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.5	13.4	12.5	13.0	12.9	12.6	10.0	10.3	10.9	11.5	12.1	12.6
							(--)	(1)	(1)	(2)	(3)	(3)
1977	13.6	14.5	15.3	16.8	18.4	19.7	21.7	24.1	27.2	30.8	33.9	36.5
	(4)	(5)	(7)	(8)	(10)	(12)	(14)	(17)	(20)	(23)	(26)	(29)
1978	39.4	42.8	46.3	50.3	54.6	59.5	63.8	66.9	69.4	71.7	75.1	79.8
	(32)	(36)	(40)	(43)	(47)	(52)	(55)	(59)	(62)	(65)	(66)	(68)
1979	84.4	88.2	93.0	97.3	100.1	102.0	104.1	107.0	109.4	110.5	110.4	110.3
	(71)	(74)	(77)	(79)	(81)	(83)	(87)	(90)	(92)	(93)	(94)	(94)
1980	109.7	108.7	109.0	110.4	112.0	113.3	114.4	115.0	114.6	114.4	114.7	114.9
	(93)	(90)	(87)	(84)	(83)	(83)	(79)	(76)	(73)	(70)	(70)	(69)
1981	116.5	119.2	118.2	114.6	111.7	110.2	109.5	110.0	111.4	112.4	112.3	111.0
	(69)	(70)	(70)	(68)	(66)	(64)	(62)	(60)	(59)	(58)	(57)	(54)
1982	108.2	104.1	101.5	100.0	98.6	96.6	93.3	88.5	83.5	80.4	75.7	72.8
	(51)	(49)	(47)	(46)	(44)	(42)	(41)	(39)	(37)	(33)	(29)	(27)
1983	69.8	67.2	65.8	65.1	64.3	63.1	61.6	61.7	62.5	62.4	62.3	62.0
	(26)	(25)	(24)	(23)	(23)	(22)	(23)	(22)	(22)	(23)	(24)	(25)
1984	61.5	60.4	58.4	55.8	53.0	50.9	50.0	48.1	45.6	44.1	42.8	41.6
	(25)	(25)	(25)	(24)	(24)	(26)	(27)	(28)	(29)	(28)	(26)	(25)
1985	41.0	40.0	38.6	37.6	37.1	36.2	34.6	33.1	32.1	31.3	30.8	29.7
	(24)	(23)	(23)	(22)	(22)	(22)	(21)	(20)	(19)	(19)	(19)	(20)
1986	29.2	29.8	29.9	29.2	27.8	26.3	25.0	23.5	22.3	21.5	20.7	20.3
	(20)	(20)	(19)	(18)	(17)	(16)	(15)	(15)	(14)	(13)	(11)	(10)
1987	19.4	18.3	17.6	17.4								
	(8)	(8)	(8)	(9)								

For each month, the upper figure is the observed or predicted Zürich smoothed sunspot number. The lower figure in parenthesis is the corresponding absolute value of the 90% prediction interval, an indication of the uncertainty above and below the predicted number. Observed numbers are those with no prediction intervals. The observed smoothed sunspot numbers are based on final Zürich numbers through 1975.

The predicted sunspot numbers are derived from a regression analysis based on cycles 8 through 20. Tests indicate that earlier cycles are from a different statistical population.

This prediction for the new sunspot cycle is based on an assumption that sunspot minimum occurred in July 1976 with a smoothed number of 10. The predictions will be changed after sunspot minimum has been observed.

Hα SOLAR FLARES

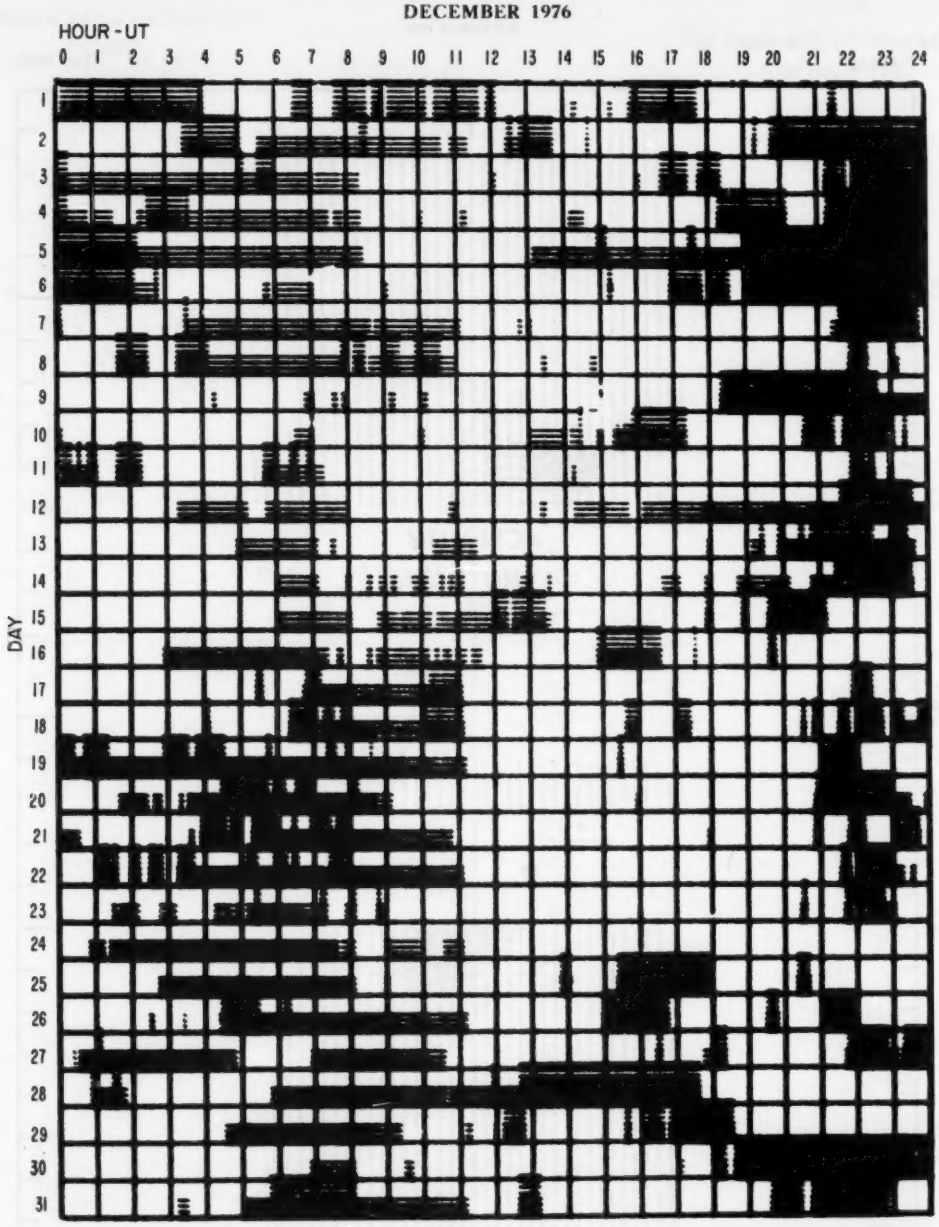
DECEMBER 1976

OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE DEC	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			COND.	TYPE	TIME — UT	MEAS. AREA millionths of Disk	CORR. AREA Sq. Deg.	
RAMY	08	1902	1909	1922	N 6	E37	.618		11.6	20	SN	3	C		114		DE H
RAMY	08	1903E	1909	1922	N 6	E38	.631		11.6	19D	SN	3	V		114		DE H
RAMY	08	1939E	1941	1950D	N24	E 2	.462		9.0	11D	SF	3	V		96		
RAMY	08	1939E	1941	1950D	N25	E 7	.489		9.3	11D	SF	3	C		96		
PALE	08	2321	2324	2331	N 5	E33	.560		11.4	10	SF	3	C		26		DE H
PALE	09	0201	0203	0219	N 4	E33	.556		11.6	18	SN	3	C		90		DE H
MITK	09	0202	0203	0215	N03	E33	.553		11.6	13	SN		C	0203	90	1.1	DH
ATHN	09	0751	0752	0831	N 2	E29	.492		11.5	40	SB	4	C		95		F H
CATA	09	0800E	0810	0839	N05	E29	.502		11.5	35D	SN	2		0810	28	.3	
ISTA	09	0820E		0825	N06	E32	.549		11.7	5D	SN						
ATHN	09	0844	0846	0857	N 2	E29	.492		11.5	13	SF	4	C		64		F
ATHN	09	1015	1021	1045	N 3	E39	.636		12.4	30	SF	4	C		32		F H
HTPR	09	1023	1026	1030	N05	E28	.488		11.5	7	SF		C	1026	10	.1	
CATA	09	1025	1025	1045D	N05	E26	.458		11.4	20D	SN	2		1025	56	.6	
HTPR	09	1128	1130	1134	N05	E27	.473		11.5	6	SF		C	1130	20	.2	E
HTPR	09	1139	1141	1146	N05	E26	.458		11.4	7	SF		C	1141	30	.3	E
HTPR	09	1233	1238	1249	N05	E25	.444		11.4	16	SF		C	1238	10	.1	D
ATHN	09	1346	1348	1357D	N 4	E25	.439		11.4	11D	SN	4	C		32		F H
RAMY	09	1651	1656	1706	N 5	E22	.399		11.4	15	SF	4	C		27		H
MITK	10	0102	0104	0113	N02	E20	.353		11.5	11	SN		C	0104	100	1.1	DH
MITK	10	0305	0307	0325	N02	E19	.337		11.6	20	SF		C	0307	50	.5	DH
ATHN	10	0835	083E	0848	N 3	E15	.280		11.5	5	SN	3	C		32		F H
BUCA	10	0839		0844	N05	E15	.294		11.5	5	SN		C	0840	53	.6	D
HTPR	13	1328	1331	1342	N05	W27	.471		11.5	14	SF		C	1331	20	.2	E
HTPR	13	1356	1403	1414	N04	W29	.497		11.4	18	SF		C	1403	20	.2	D
CATA	14	0710E	0715	0755D	S29	W02	.443		14.1	45D	SN	2		0715	56	.6	
MCMA	14	1507	1512	1514D	N02	W43	.685	14553	11.4	7D	SN		C	1512	50	.7	DH
MCMA	14	1734E		1738D	N02	W44	.698	14553	11.4	4D	SN		C	1734	50	.7	D
RAMY	14	1917E	1922	1938	N 4	W46	.725		11.4	21D	SN	3	C		121		F H
RAMY	14	1917E	1922	1938	N 4	W46	.725		11.4	21D	SN	3	V		121		F H
MITK	15	0302	0305	0316	N03	W48	.747		11.5	16	SN		C	0305	50	.8	E
KODA	15	0303	0303	0314	N04	W49	.760		11.5	11	SN			0303	1		CD
HTPR	15	1315	1319	1336	S26	W17	.477		14.3	15	SF		C	1319	20	.2	U
HTPR	15	1345	1351	1408	N04	W54	.813		11.5	23	SF		C	1351	20	.3	E
MCMA	15	1347E		1405D	N03	W54	.812	14553	11.5	18D	SN		C	1401	40	.7	E
HTPR	15	1456	1459	1520	N04	W55	.823		11.5	24	SN		C	1459	40	.7	E
MCMA	15	1457E	1459	1510D	N03	W54	.812	14553	11.6	13D	SB		C	1459	45	.8	E
RAMY	15	1458	1501	1519	N 3	W55	.822		11.5	21	SB	3	C		90		Z F
RAMY	15	1459E	1502	1515D	N 3	W55	.822		11.5	17D	SB	3	V		121		FDE
RAMY	16	1251	1255	1306D	N26	W36	.707		13.8	15D	SF	4	C		46		FDE
HTPR	25	1258	1302	1306	S20	E65	.914		30.4	8	SF		C	1302	20	.5	D
HTPR	25	1438	1443	1510	S20	E72	.954		31.0	32	SF		C	1443	30		
HTPR	27	1136	1144	1153	S23	E40	.700		30.5	17	SF		C	1144	20	.3	E
HTPR	27	1303	1307	1316	S23	E39	.690		30.5	13	SF		C	1307	10	.1	D
RAMY	27	2012	2015	2020	S20	E35	.629		30.5	8	SN	4	C		35		DE
PALE	28	1801	1809	1826	S21	E27	.544		30.8	19	SF	3	C		65		FDE
RAMY	28	1930E	1940U	2005D	S19	E25	.505		30.7	35D	SF	3	C		65		
BUCA	29	0851		0924	S20	E24	.503		31.2	33	SN		C	0900	107	1.3	U
RAMY	29	1138	1151	1158D	S22	E17	.449		30.4	20D	SF	3	C		53		
RAMY	29	1155E	1200U	1210D	S19	E16	.404		30.7	15D	SF	3	V		70		
HTPR	29	1333	1338	1343	S22	E09	.386		30.2	10	SF		C	1338	30	.3	DH
HTPR	29	1350	1359	1411	S23	E21	.499		31.2	21	SF		C	1359	10	.1	D
HTPR	29	1444	1445	1456	S20	E08	.350		30.2	6	SF		C	1445	30	.3	
HTPR	29	1512	1513	153.	S23	E20	.489		31.1	18	SF		C	1513	10	.1	
MITK	30	0501	0518	0635	S22	E10	.394	14573	31.0	89	1N		C	0518	200	2.2	E
MITK	30	0510	0514	0524	S29	E16	.529		31.4	14	SF		C	0514	70	.8	E
MITK	30	0605	0614	0650D	S24	E13	.443		31.2	45D	SN		C	0614	50	.6	E
HEND	31	0858		0916	S20	W15	.409		30.2	18	SN						
MCMA	31	1612		1430D	S23	W20	.492	14579	30.3	18D	SB		C	1821	40	.4	E

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

DECEMBER 1976



Observatories included in total patrol:

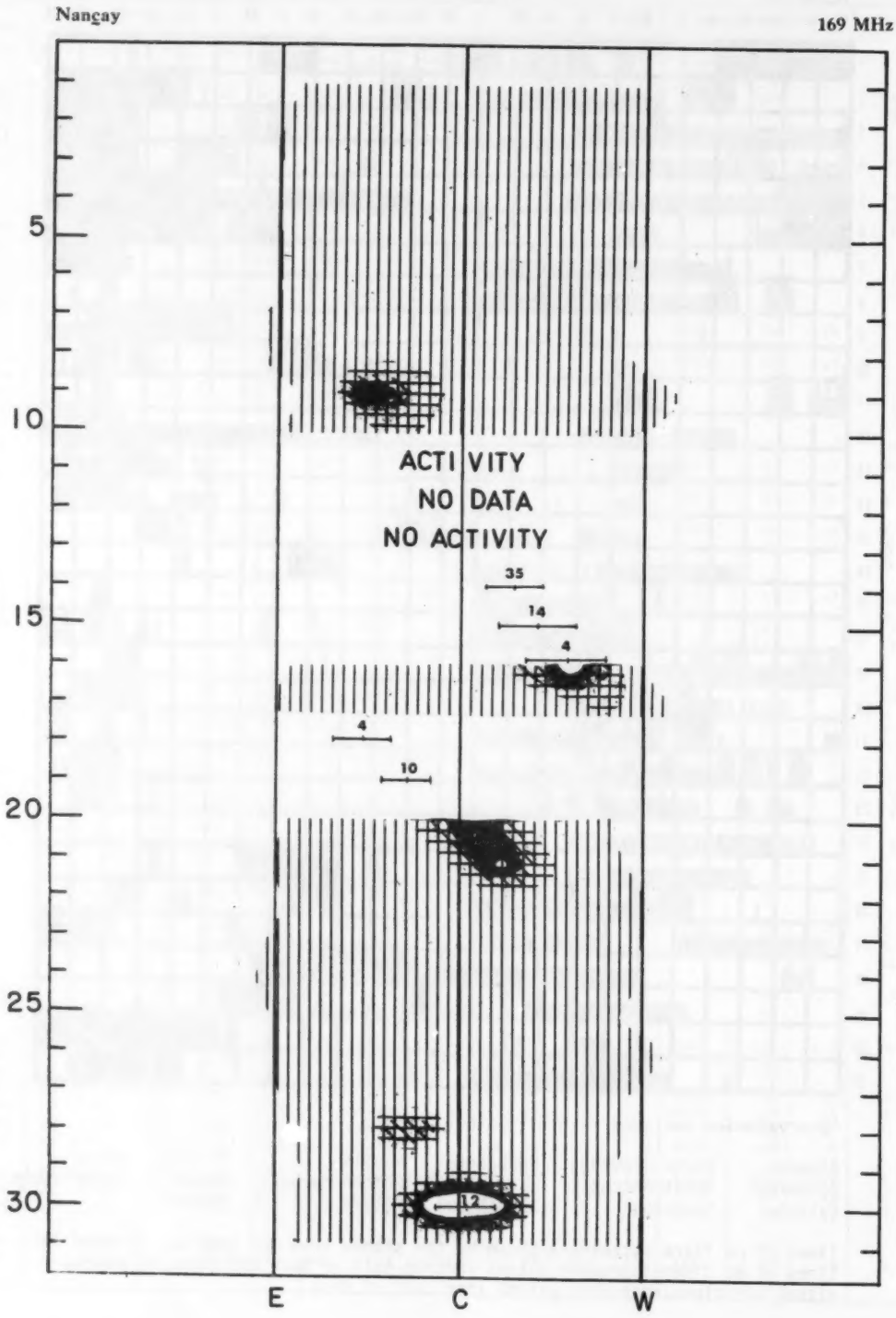
Athenes	Haute Provence	Hurbanovo	Manila	Palehua	Upice
Bucharest	Herstmonceux	Istanboul	McMath-Hulbert	Ramey	Wendelstein
Catania	Huancayo	Kodaikanal	Mitaka	Tehran	

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

12
Dec 76

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

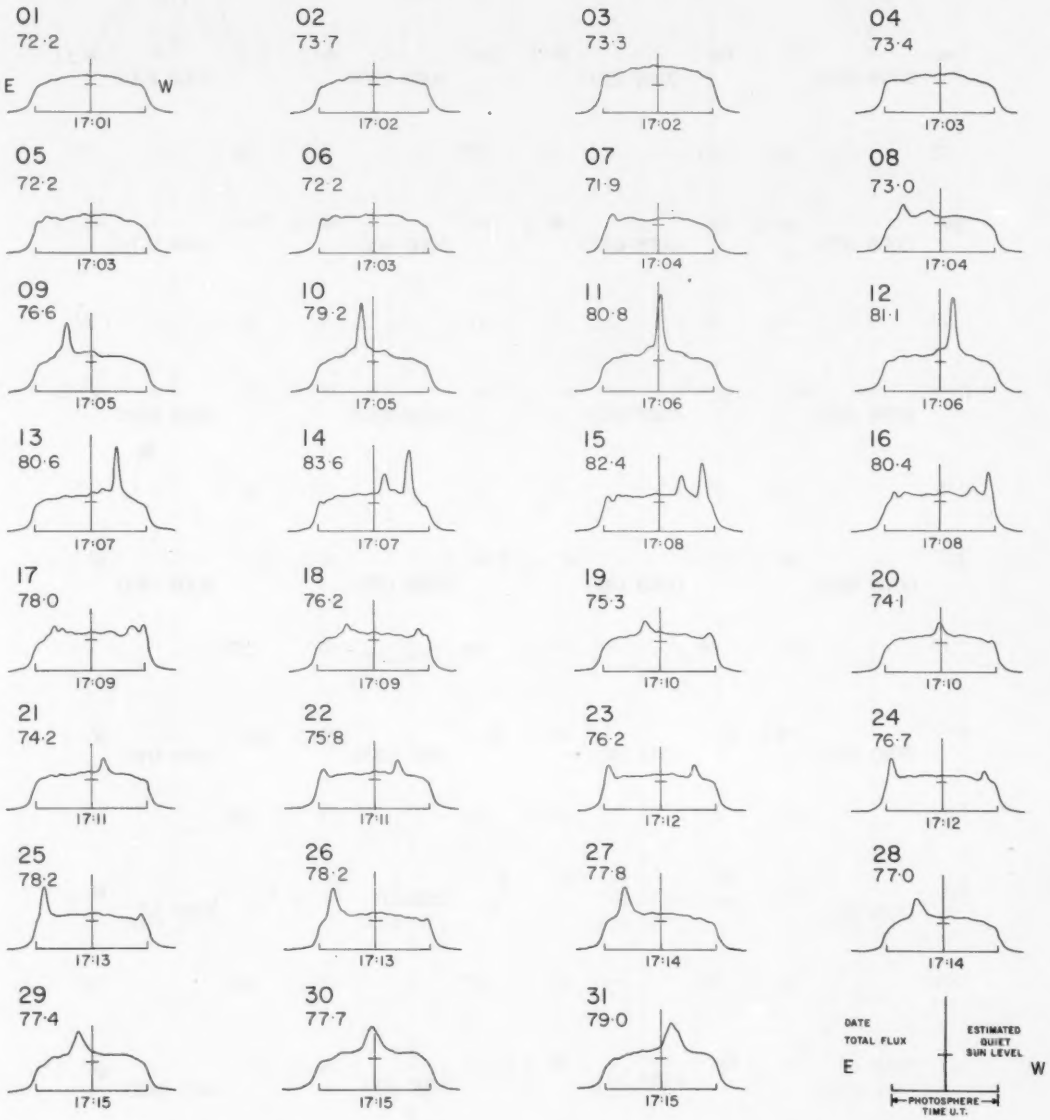
DECEMBER 1976



EAST-WEST SOLAR SCANS
DECEMBER 1976

ALGONQUIN RADIO OBSERVATORY
CANADA

10·7cm
Fan Beam with 1·5 minutes of arc
E-W Resolution



14
Dec 76

EAST-WEST SOLAR SCANS

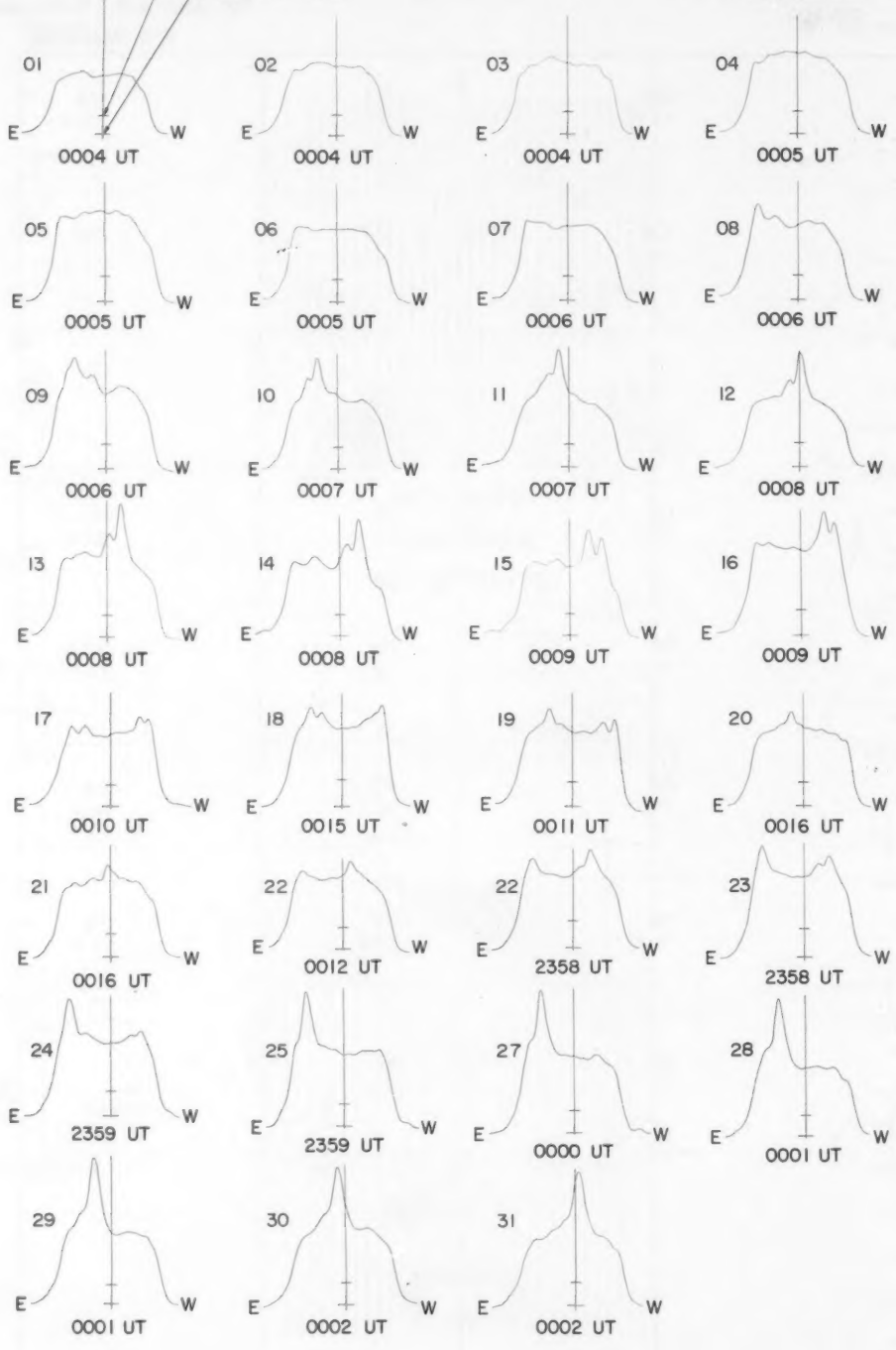
DECEMBER 1976

Fleurs, Australia

ESTIMATED QUIET SUN LEVEL

COLD SKY LEVEL

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



EAST-WEST SOLAR SCANS

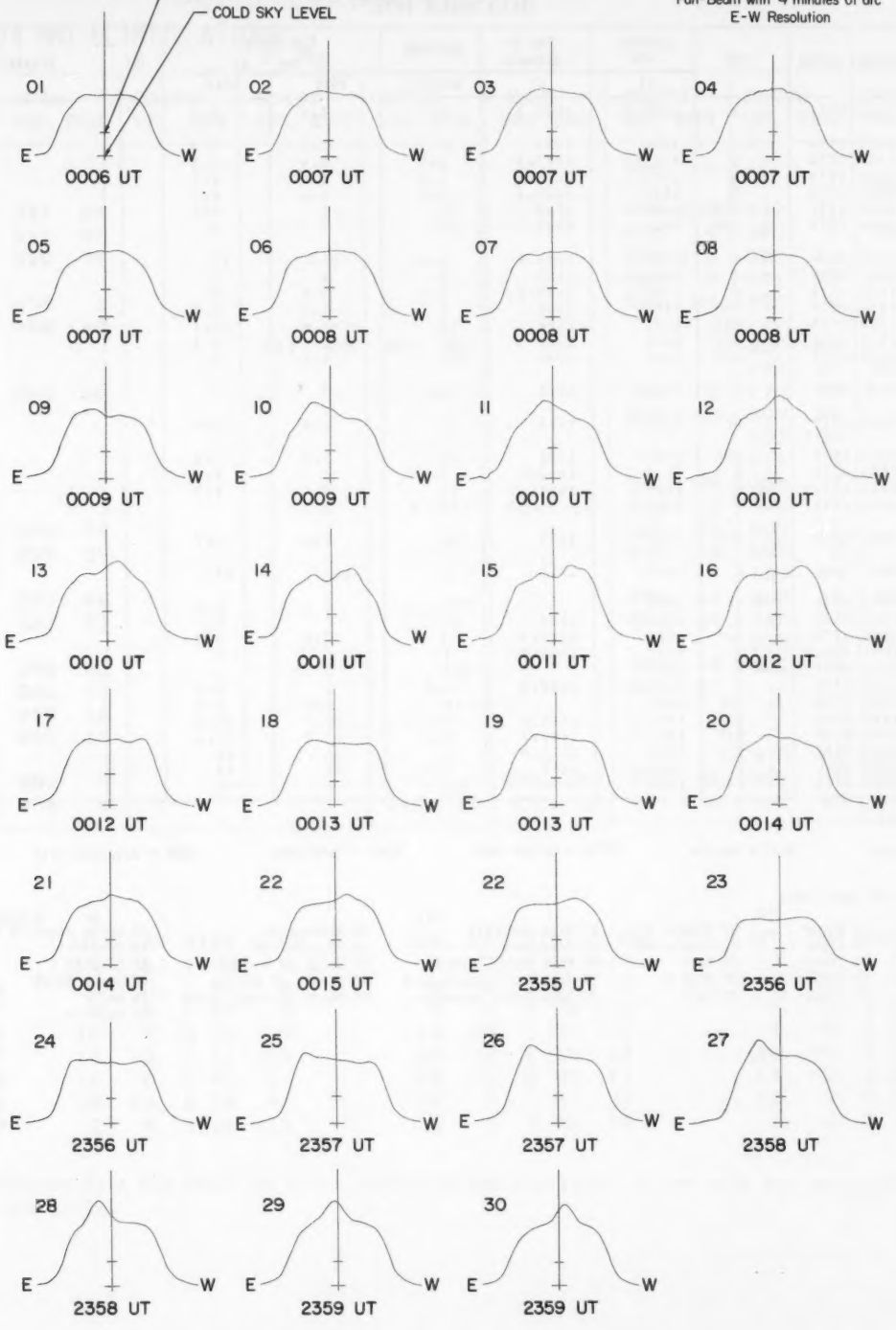
DECEMBER 1976

Fleurs, Australia

ESTIMATED QUIET SUN LEVEL

COLD SKY LEVEL

43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution



SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

DECEMBER 1976

	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
3	2800	OTTA	1 S	1622.5	1625.8	5.2	0.8	0.3		
14	2800	OTTA	1A S	1426	1430	10	0.6	0.3		
	2800	OTTA	3 S	1427.5	1427.5	0.5	6.4	1.6		
	2800	OTTA	4 S	1436.3	1436.8	0.5	1.4	0.7		
	2800	OTTA	5 S	1512	1212.2	0.5	1.4	0.7		
	2800	OTTA	22 GRF	1725	1745	55	1	0.6		
	2800	OTTA	26 GRF	1914	1923	40	2	1		
15	8800	SGMR	3 S	1458.5	1458.8	1.8	26	14		
	2695	BOUL	3 S	1459.5	1500	2	8	2		
	2800	OTTA	1 S	1458.5	1459.2	1.5	9.6	5		
	2800	OTTA	23 PBI	1500	1500	5	1.6	0.8		
	2800	OTTA	2o FAL	1508	1526	18	-1.4	-0.7		
	2800	OTTA	2J GRF	1655	1712	35	0.6	0.3		
	2695	PENT	2. GRF	2000	2030	120	1.6	1		
21	2695	BOUL	6 S	1849	1900	2.5	9	3		
23	2800	OTTA	2 S/F	1502.9	1503	1	3.6	0.8		
25	2800	OTTA	21 GRF	1432	1501	85	1.2	0.8		
	2800	OTTA	1 S	1440.5	1442.3	3.5	1	0.4		
	2800	OTTA	24U R	1625	1641	16	1	0.5		
	2800	OTTA	24P R	1641		180 D	1			
28	2800	OTTA	2. GRF	1730	1835	180	5.4	2.7		
29	2695	BOUL	~. C	1815	1819	6	163	25		
31	2800	OTTA	27A RF	1602		248	2	1.5		
	2800	OTTA	24 R	1602	1622	20	2	1		
	2800	OTTA	2 S/F	1606	1609.3	9	9.2	2.5		
	2695	BOUL	3 S	1610	1610.5	1	6	2		
	2800	OTTA	24P R	1622		125	2			
	2800	OTTA	1 S	1801.5	1802.5	4.5	1	0.5		
	2800	OTTA	21 GRF	1812		16	1.4	0.7		
	8800	SGMR	- S/F	1814.1	1814.5	9.8	50.7	15.2		
	2695	SGMR	4 S/F	1814.4	1815.3	8.2	47.9	14.4		
	2800	OTTA	4 S/F	1815	1815.8	4	48	16		
	2695	BOUL	6 S	1815.5	1817	3.5	41	13		
	2800	OTTA	26 FAL	1827	2010	103	-2	-1		

Observatories:

BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

SOLAR WIND

Interplanetary Scintillations

DECEMBER 1976

UCSD 74 MHZ SCINTILLATIONS

DAY	3C48 VEL	3C48 ERR	3C144 VEL	3C144 ERR	3C147 VEL	3C147 ERR	3C161 VEL	3C161 ERR	3C237 VEL	3C237 ERR	3C273 VEL	3C273 ERR	3C298 VEL	3C298 ERR	3C459 VEL	3C459 ERR
1											354	*				
3															355	28
4	351	29									493	135	443	31		
5	411	34									492	14	393	7	348	*
6	310	14									778	116	332	13		
7											434	8	451	33	391	38
8	434	1									428	27	506	8		
9	408	40														
10					441	85	393	87					520	40		
11													770	24	583	163
12	543	68									346	4	710	91		
13											600	63	602	26		
14													537	102		
16													411	8		
17											521	88	386	7		
18									454	12	523	2	423	6		
19	272	49									520	29	403	17		
20	259	35									448	5	388	2		
21													458	14		
22	350	48									290	16	363	45	438	130
23	337	27									336	69	342	41	0	0
24													314	6	340	43
25	398	33									347	18	363	0		
26	360	17									495	57				
27	259	16														
28	240	19														
29													473	24	360	17
30	289	3							598	44	577	80	397	9	350	18
31	406	5					614	18	535	48	434	16	460	10	490	59

DECEMBER	5 UT	LAT	DIST	DLON	15 UT	LAT	DIST	DLON	25 UT	LAT	DIST	DLON
3C48	5.	6.	1.23	-8.	4.	5.	1.21	-10.	3.	4.	1.17	-11.
3C144	9.	0.	1.30	2.	8.	-1.	1.30	-0.	7.	-2.	1.30	-3.
3C147	8.	5.	1.27	3.	7.	4.	1.28	1.	6.	3.	1.27	-1.
3C161	10.	-7.	1.25	4.	10.	-8.	1.27	2.	9.	-8.	1.27	-0.
3C237	14.	-2.	1.11	15.	13.	-3.	1.15	14.	12.	-4.	1.19	12.
3C273	16.	0.	0.93	21.	15.	-1.	0.99	17.	14.	-2.	1.04	17.
3C298	18.	12.	0.74	41.	17.	7.	0.84	32.	16.	3.	0.91	23.
3C459	2.	4.	1.08	-15.	2.	3.	1.03	-16.	1.	2.	0.98	-17.

* indicates data for which no error estimates are available, since only two antennas were operating.

SOLAR X-RAYS BY SATELLITE
SMS GOES

DECEMBER 1976

.5 - 4Å Hourly Averages (10^{-5} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
12/ 1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
12/ 2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B
12/ 3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.01	B	B	B	B	B	B	B
12/ 4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 6	B	B	B	B	B	B	0.02	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/10	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/11	B	B	M	B	B	B	B	B	B	B	B	B	M	M	M	B	B	B	B	B	B	B	B	B	B
12/12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/16	B	B	B	B	0.02	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/24	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/25	0.01	B	B	B	B	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B
12/26	B	B	B	B	B	B	B	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/27	B	B	B	B	B	B	B	B	M	M	M	M	M	B	B	B	B	B	0.02	B	B	B	0.01	B	B
12/28	B	B	B	B	B	B	B	0.02	B	B	0.02	M	M	M	B	M	B	B	B	B	B	B	B	B	B
12/29	B	B	B	B	B	B	B	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/30	B	B	B	B	B	B	B	B	B	B	B	B	B	0.04	B	0.01	B	B	B	B	B	B	B	B	B
12/31	B	B	B	B	B	B	B	B	B	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE
SMS GOES
DECEMBER 1976

1 - 8Å Hourly Averages (10^{-4} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
12/ 1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
12/ 2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B
12/ 3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.01	0.01	B	B	B	B	B	B	B
12/ 4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/ 9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/10	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B	B	0.06	B	B	B	B	B	B	B
12/11	B	B	M	B	B	B	B	B	B	B	B	B	M	M	M	B	0.06	B	B	B	B	B	B	B	B
12/12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/16	B	B	B	B	0.02	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/18	B	B	B	B	B	B	B	B	B	B	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.02	0.03	B
12/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/24	B	0.02	B	B	B	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0.01	B	B	B	B
12/25	B	B	B	B	B	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B
12/26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/27	B	B	B	B	B	B	B	B	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B
12/28	B	B	B	B	B	B	B	B	B	B	B	M	M	M	B	M	B	B	B	B	B	B	B	B	B
12/29	B	B	B	B	B	B	B	M	B	B	B	B	B	B	B	B	B	B	0.01	B	B	B	B	B	B
12/30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12/31	B	B	B	B	B	B	B	B	B	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE

GOES-1

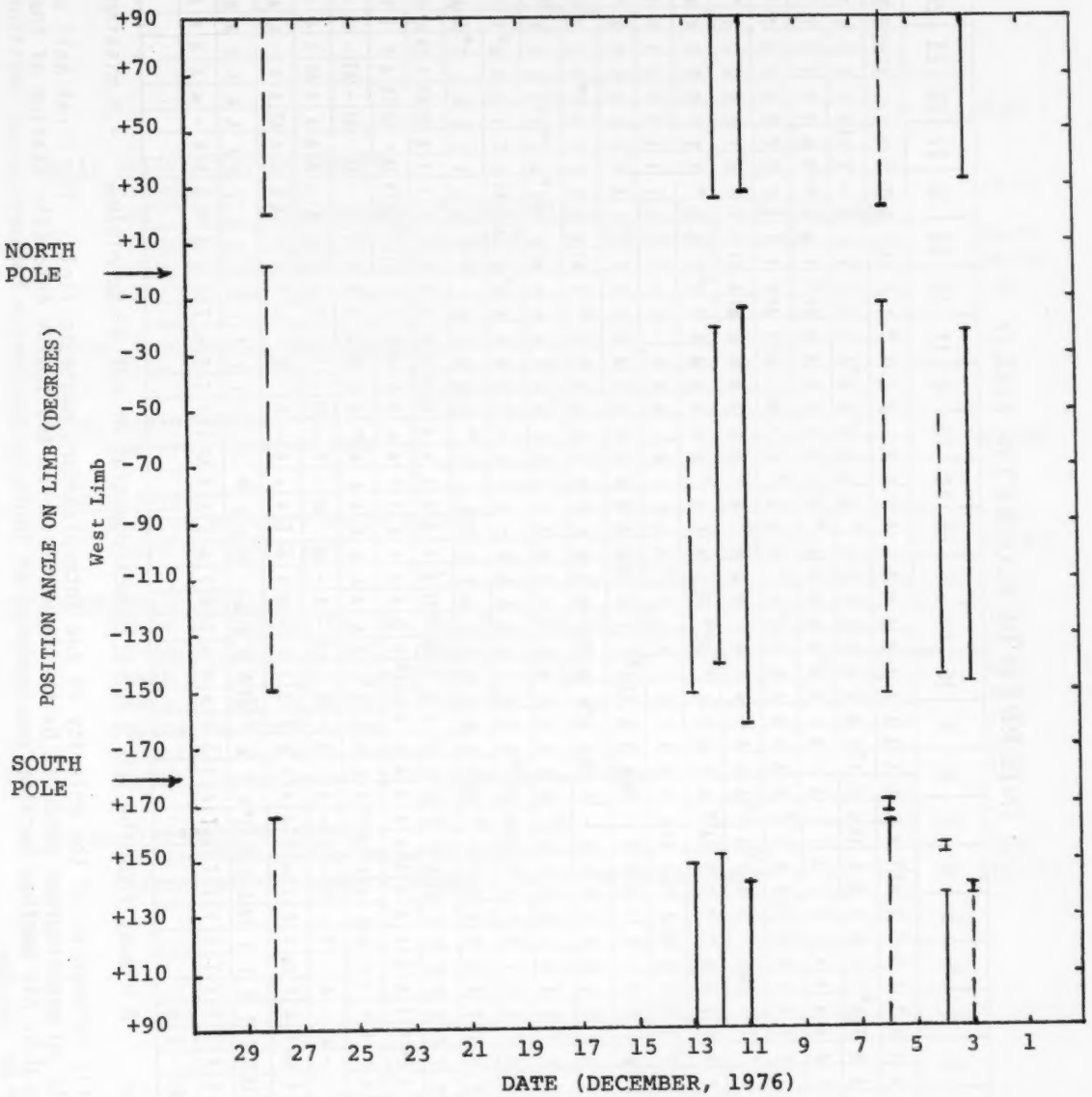
DECEMBER 1976

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
14	2229		6.80E-5	2241		2.38E-3	2246		1.15E-3
17	1001		2.70E-5	1028		1.90E-3	1055		9.40E-4
23	1303		2.69E-4	1320		1.08E-3	1403		6.65E-4
23	1953		2.69E-4	2005		4.36E-3	2013		2.16E-3
25	0007		7.67E-5	0020		1.62E-3	0022		1.97E-4
31	1812		2.56E-4	1818		3.35E-3	1823		1.50E-3

CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

DECEMBER 1976



INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1942	AUG 4	A A A A A T	A A T T AT	T A A A A A

NOVEMBER 1976 DATA

Contents

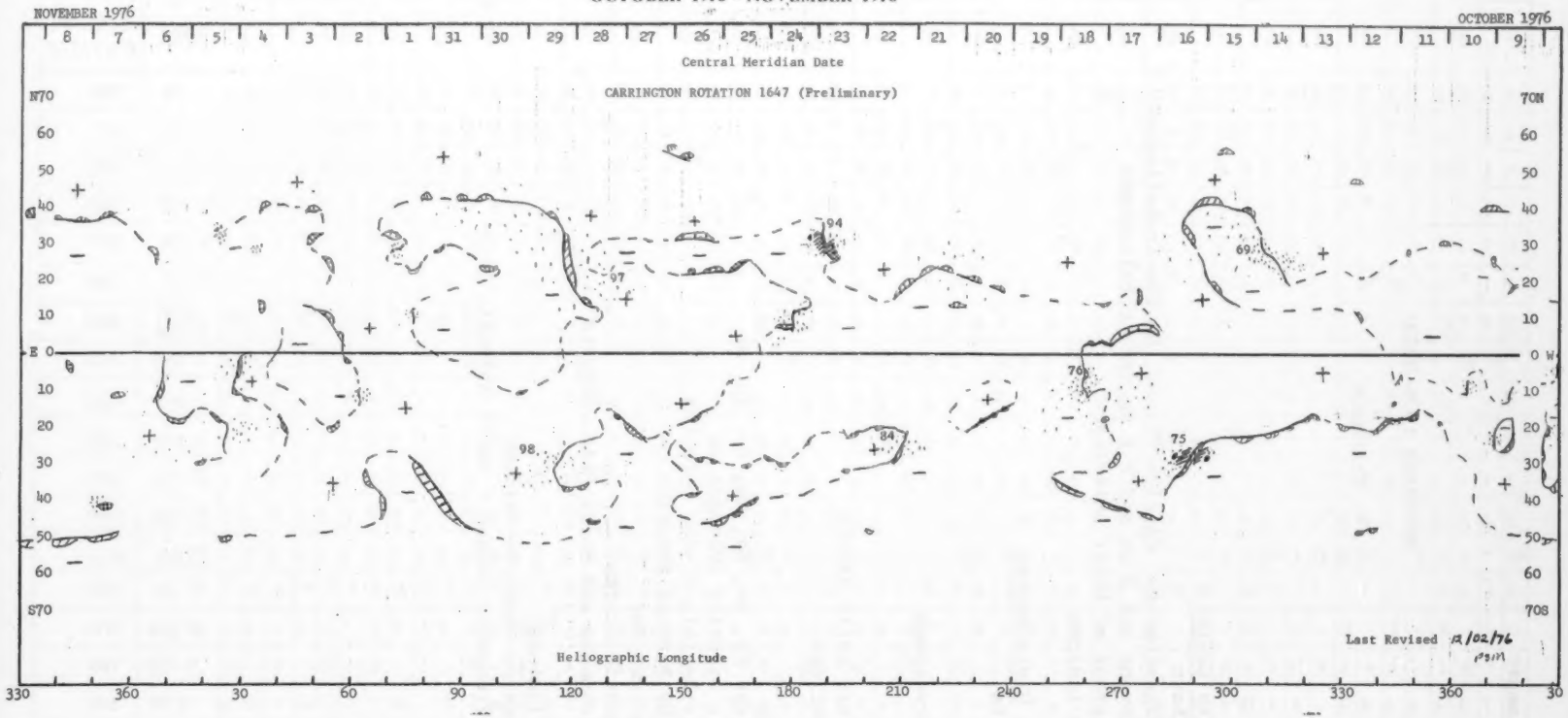
	Page
Daily Solar Activity Center	
Hα Synoptic Chart	24-25
X-ray, EUV, Magnetograms, Calcium Plages, Hα Spectroheliograms Sunspots, Corona and 2 cm and 8.6 mm Spectroheliograms	26-85
Individual Regions of Solar Activity	86-90
Daily Calcium Indices	90
Sudden Ionospheric Disturbances	
Table of Events	91
Solar Radio Waves	
Spectral Observations	92-96
Cosmic Rays	
Neutron Monitors Daily Values	97
Chart of Variations	98-101
Geomagnetic Indices	
Table of Indices Kp, Kn, Ks, Km, Cp, Ap, aa	102
12-Month Table of Daily Averages Ap	103
Chart of Kp by Bartels 27-day Rotation	104
Chart of Dst by Bartels Rotation	105
Equatorial Indices Dst	106
Principal Magnetic Storms	107
Sudden Commencements and Solar Flare Effects	108
Radio Propagation Indices	
Quality Indices on Paths to Germany	109
Transmission Frequency Ranges - North Atlantic Path	110-111

magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

24 Nov 76

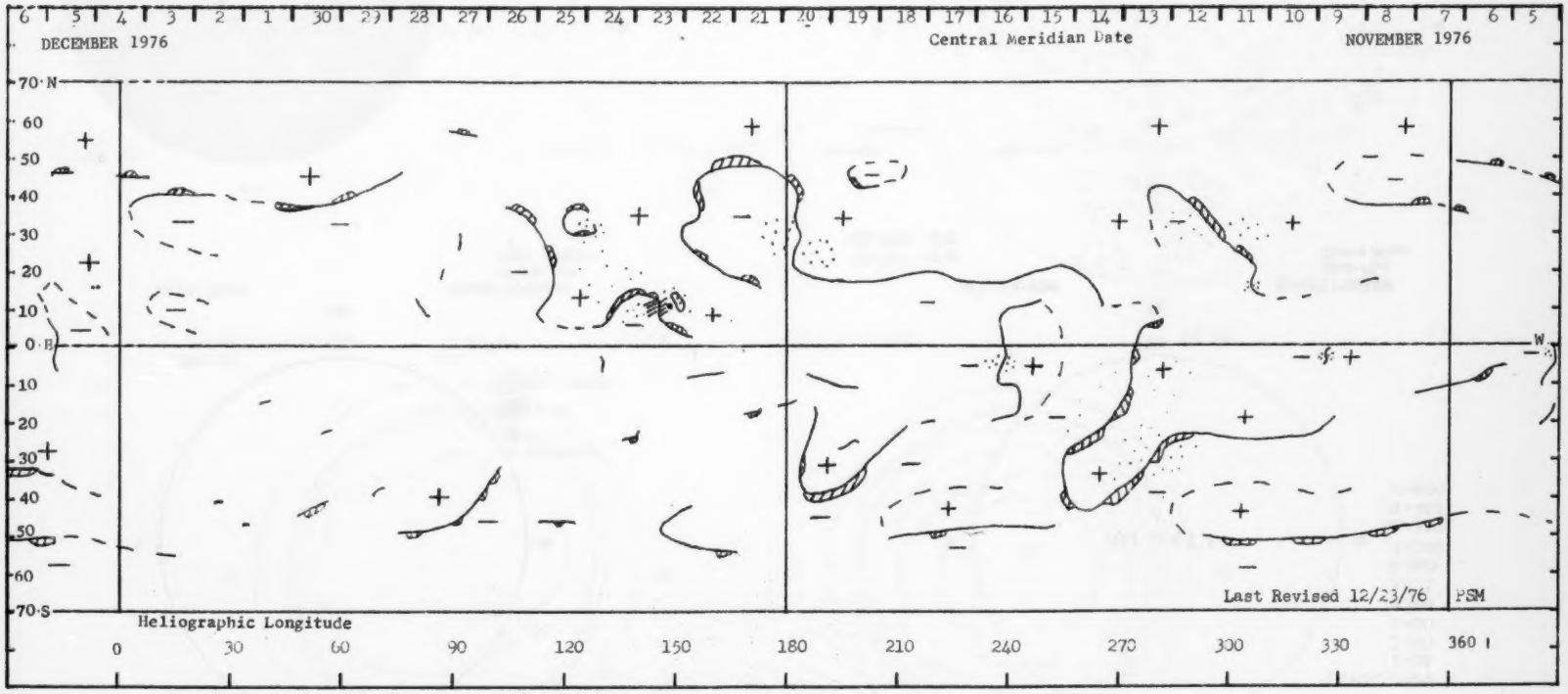
Hα SYNOPTIC CHART

OCTOBER 1976 - NOVEMBER 1976



Hα SYNOPTIC CHART

CARRINGTON ROTATION 1648 (Preliminary)



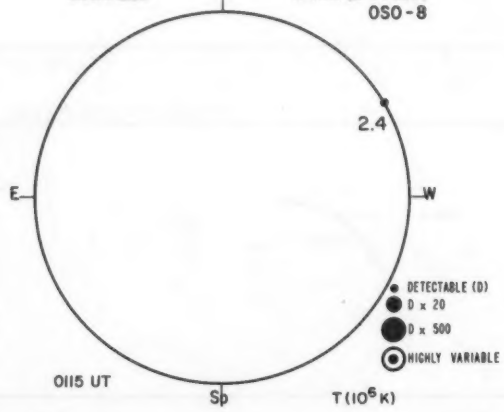
25 Nov 76

NOVEMBER 1, 1976 (P = 24.52, B_o = 4.33, L_o = 81.77)

LOCKHEED

Np

X-RAY (2-14 keV)
OSO-8



Np

KITT PEAK

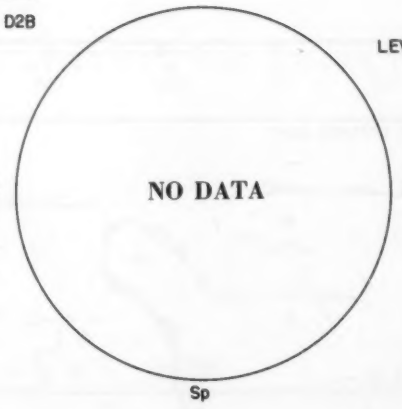
MAGNETOGRAM
Bright - Plus
Dark - Minus

CNRS LPSP
AURA D2B

Np

FE XV
284 A

LEVEL 0 = 20
1 = 28
2 = 40
3 = 56
4 = 80
5 = 113
6 = 160
7 = 226
8 = 320
9 = 452
10 = 640



E

NO KITT PEAK MAGNETOGRAMS WERE PRODUCED FOR OCTOBER 19 - NOVEMBER 28, 1976.

W

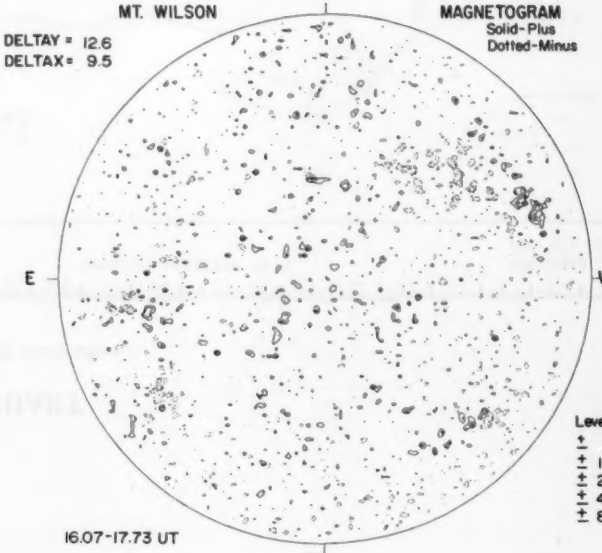
Sp

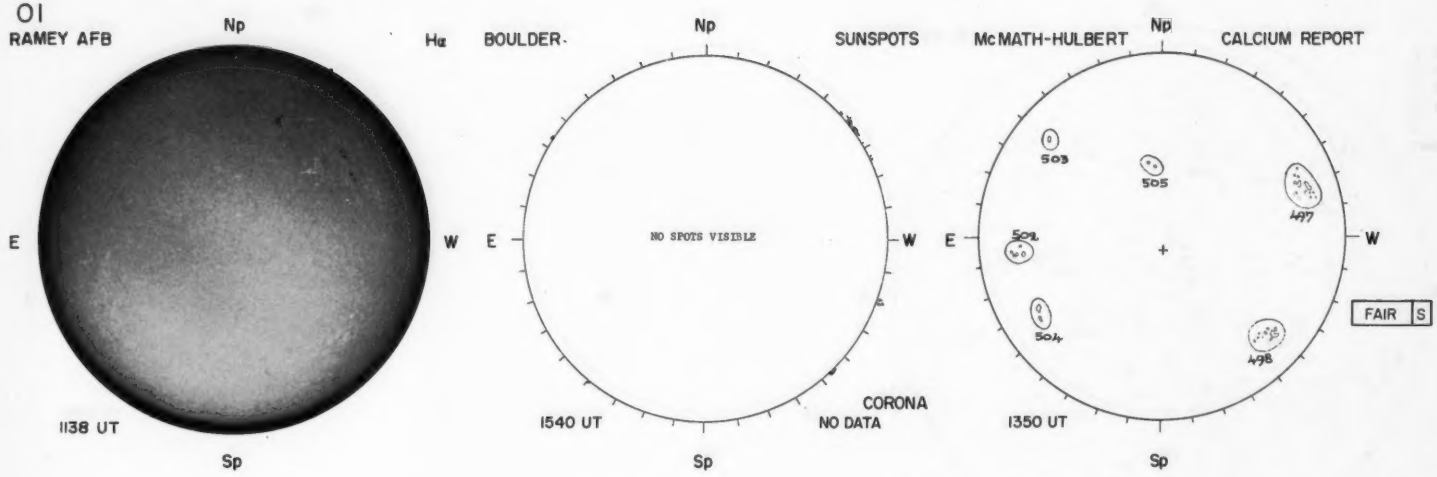
Np

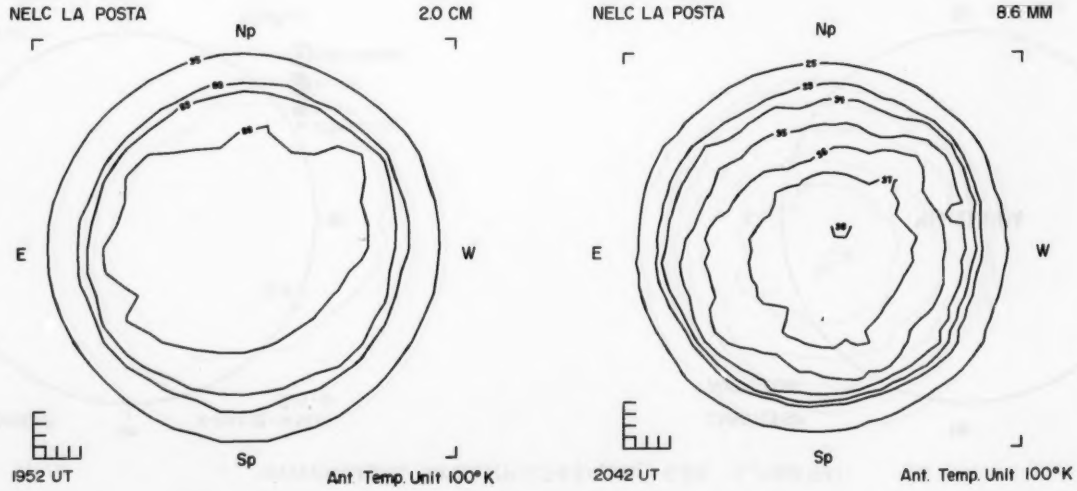
MT. WILSON

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.5

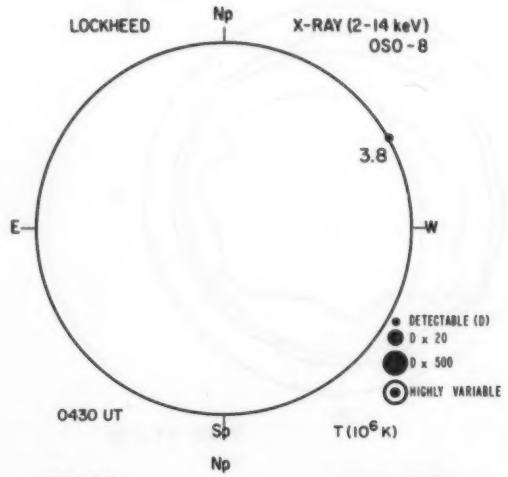



01
RAMEY AFB
Np
Hα
E
W
1138 UT
Sp
BOULDER
Np
SUNSPOTS
NO SPOTS VISIBLE
E
W
1540 UT
Sp
CORONA
NO DATA
McMATH-HULBERT
Np
CALCIUM REPORT
503
505
497
502
504
498
E
W
FAIR
S
1350 UT
Sp


NELC LA POSTA
2.0 CM
Np
E
W
Sp
1952 UT
Ant. Temp. Unit 100°K
NELC LA POSTA
8.6 MM
Np
E
W
Sp
2042 UT
Ant. Temp. Unit 100°K

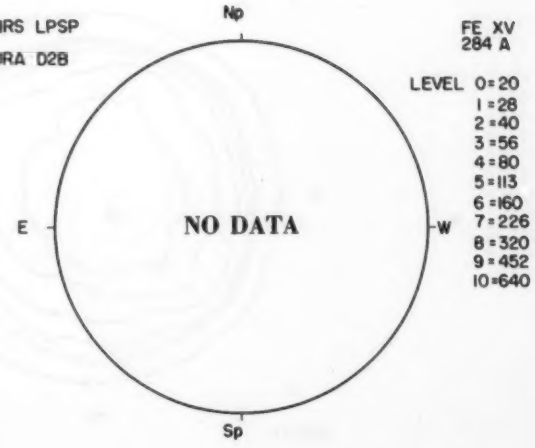
27 Nov 76

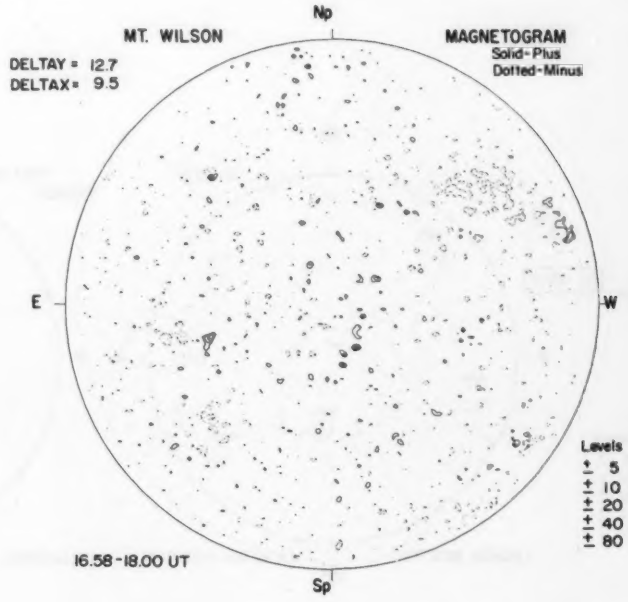
NOVEMBER 2, 1976 (P = 24.34, B_o = 4.23, L_o = 68.58)



KITT PEAK

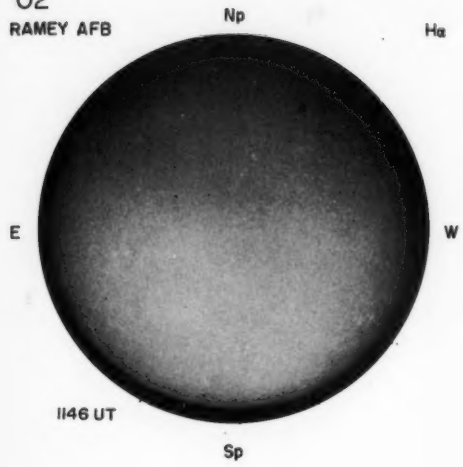
MAGNETOGRAM
Bright - Plus
Dark - Minus





02

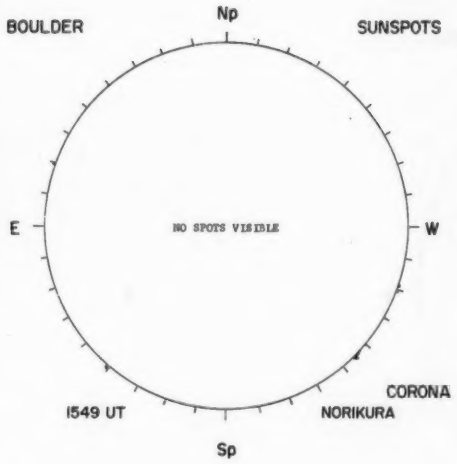
RAMEY AFB



1146 UT

Hα

BOULDER



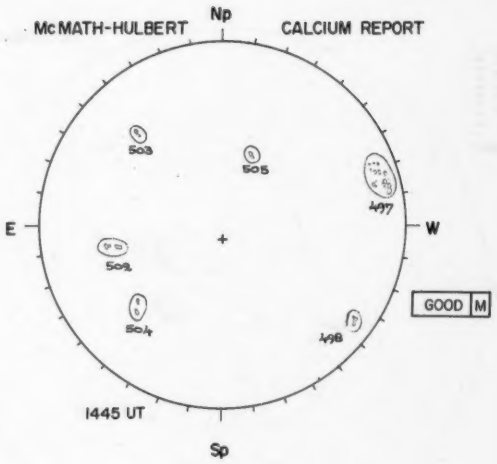
1549 UT

SUNSPOTS

CORONA

NORIKURA

McMATH-HULBERT

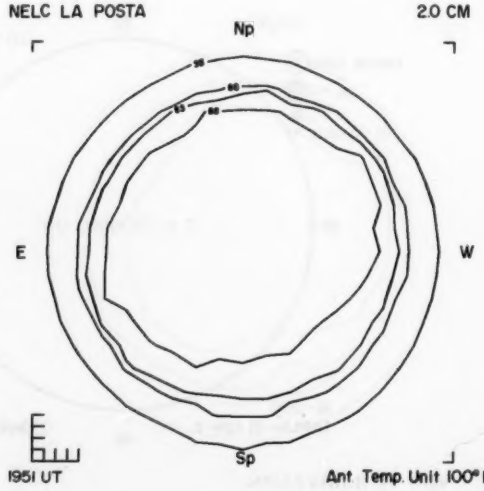


1445 UT

CALCIUM REPORT

NELC LA POSTA

2.0 CM

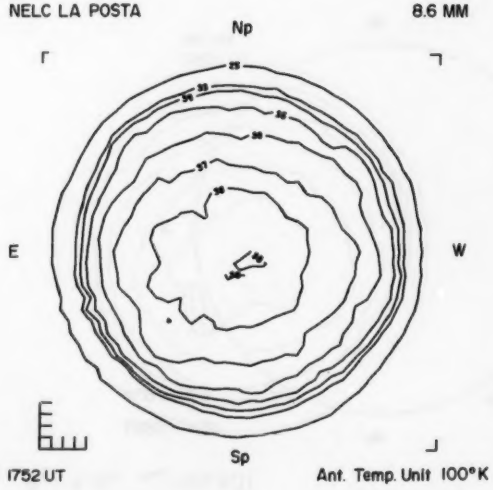


1951 UT

Ant. Temp. Unit 100°K

NELC LA POSTA

8.6 MM

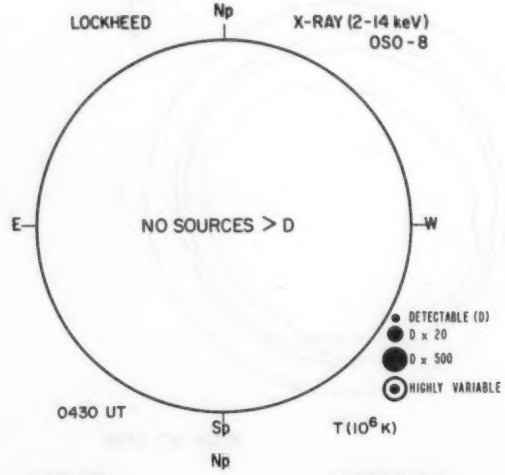


1752 UT

Ant. Temp. Unit 100°K

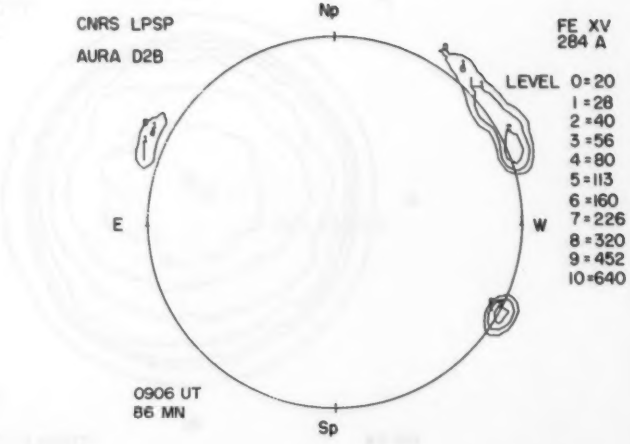
29 Nov 76

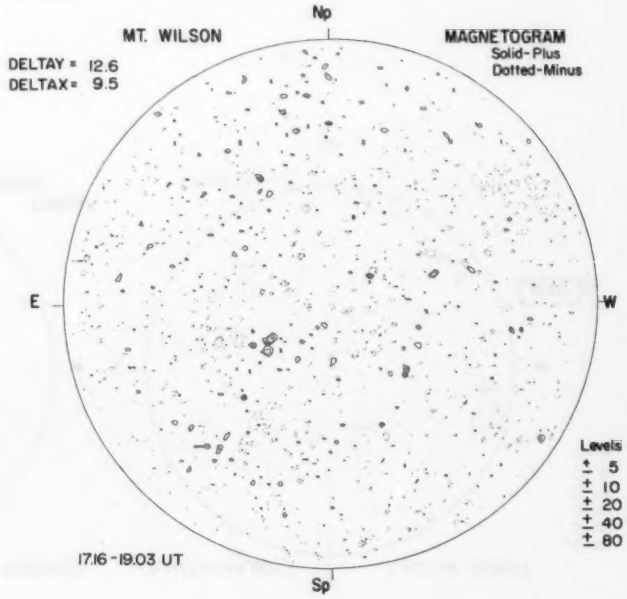
NOVEMBER 3, 1976 (P = 24.16, B_0 = 4.12, L_0 = 55.40)



KITT PEAK

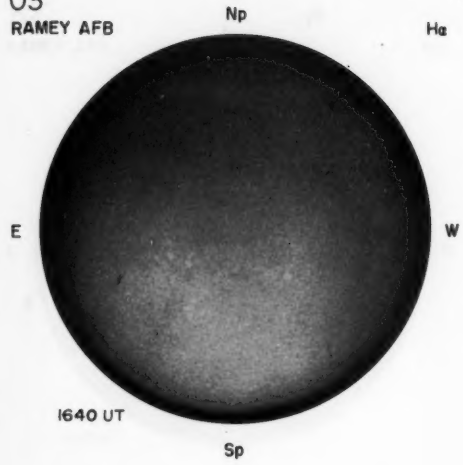
MAGNETOGRAM
Bright - Plus
Dark - Minus





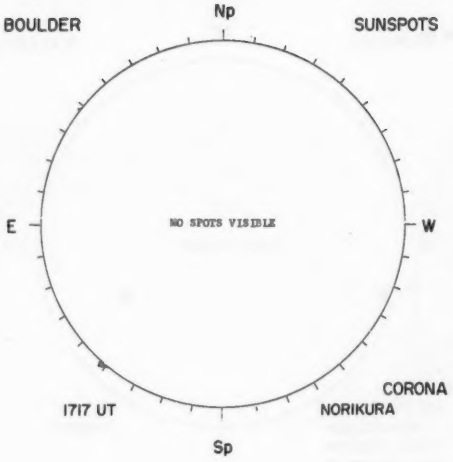
03

RAMEY AFB



Hα

BOULDER



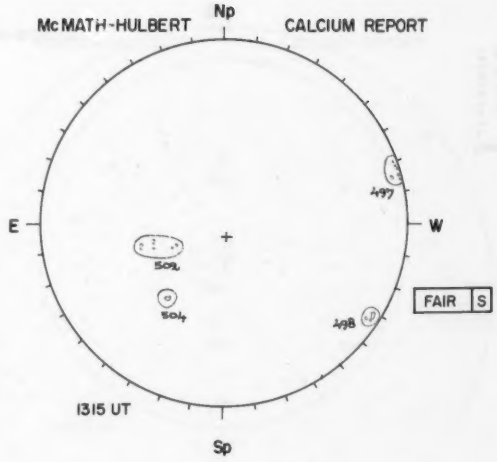
SUNSPOTS

CORONA

NORIKURA

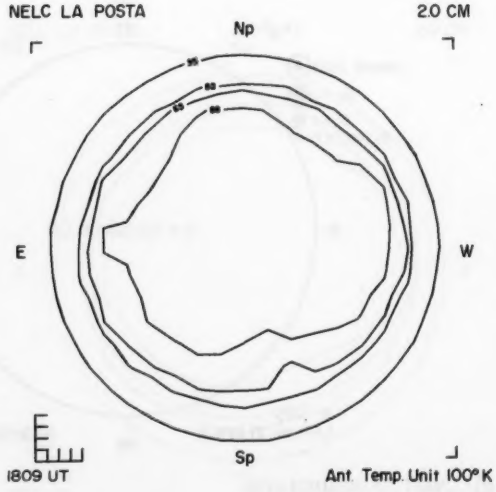
McMATH-HULBERT

CALCIUM REPORT



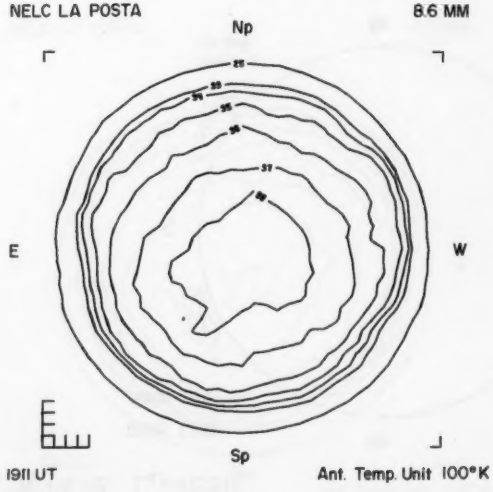
NELC LA POSTA

2.0 CM



NELC LA POSTA

8.6 MM



NOVEMBER 4, 1976 (P = 23.98, B_o = 4.02, L_o = 42.21)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

Np

E

W

NO SOURCES > D

DETECTABLE (D)
D x 20
D x 500
HIGHLY VARIABLE

0415 UT

Sp

T(10^6 K)

Np

KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

CNRS LPSP
AURA D2B

Np

FE XV
284 A

LEVEL 0 = 20
1 = 28
2 = 40
3 = 56
4 = 80
5 = 113
6 = 160
7 = 226
8 = 320
9 = 452
10 = 640

E

W

0343 UT
44 MN

Sp

E

W

Sp

MT. WILSON

DELTAY = 12.6
DELTAX = 9.4

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

E

W

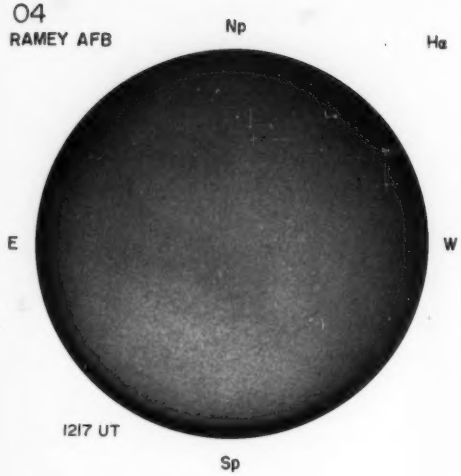
Levels
± 5
± 10
± 20
± 40
± 80

17.58 - 19.50 UT

Sp

04

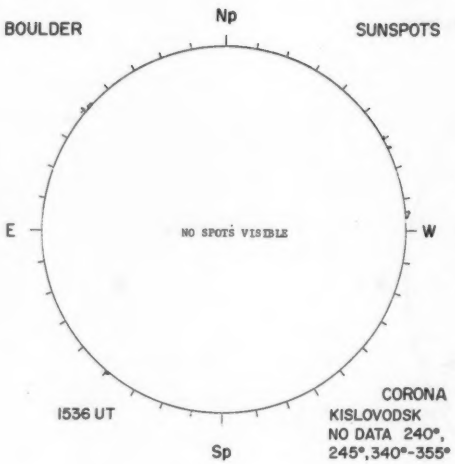
RAMEY AFB



1217 UT

Hα

BOULDER



1536 UT

SUNSPOTS

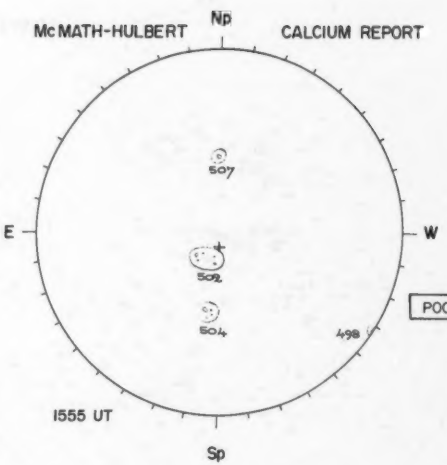
CORONA

KISLOVODSK

NO DATA 240°,

245°,340°-355°

McMATH-HULBERT



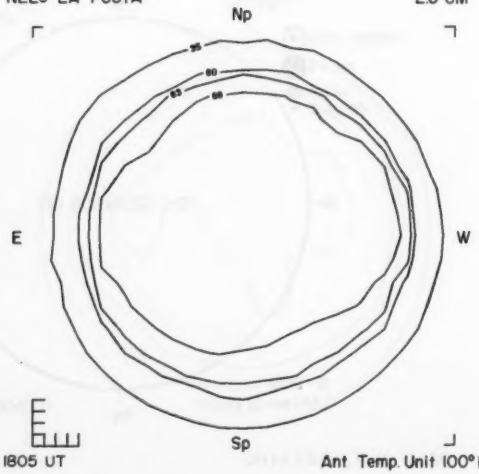
1555 UT

CALCIUM REPORT

POOR | M

NELC LA POSTA

2.0 CM

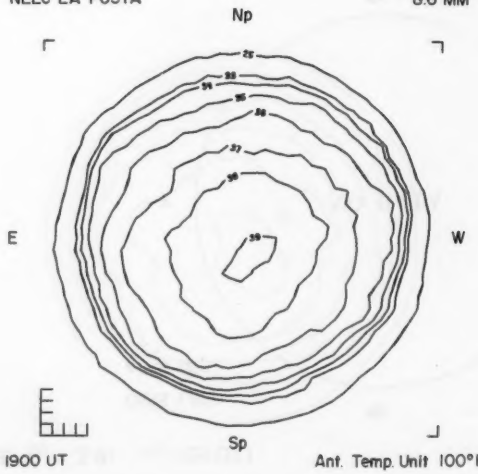


1805 UT

Ant. Temp. Unit 100°K

NELC LA POSTA

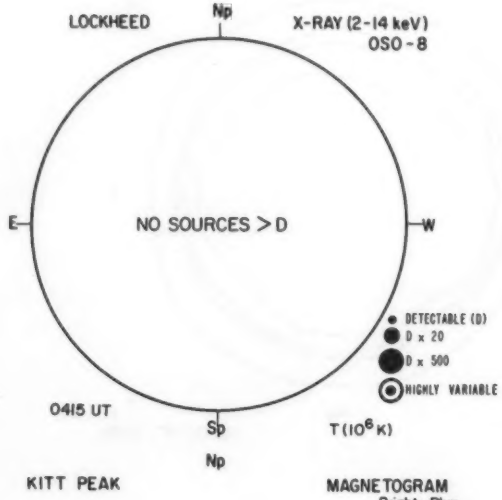
8.6 MM

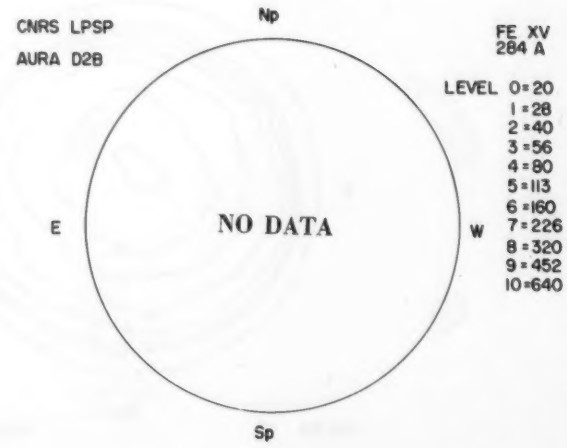


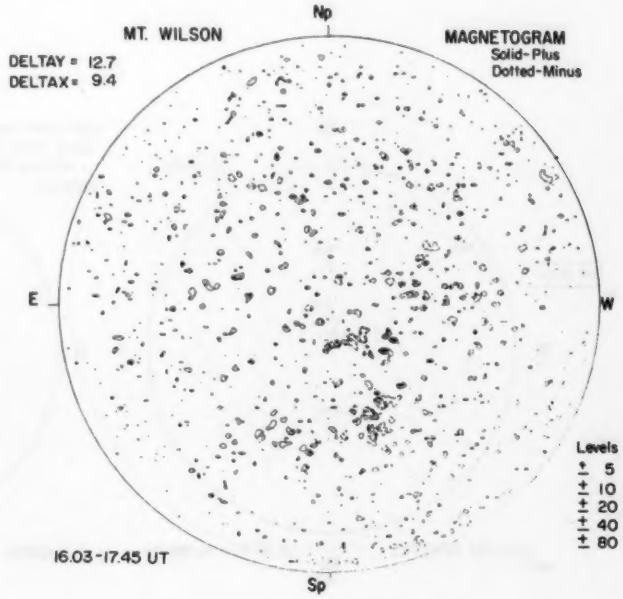
1900 UT

Ant. Temp. Unit 100°K

NOVEMBER 5, 1976 (P = 23.78, B_o = 3.91, L_o = 29.02)

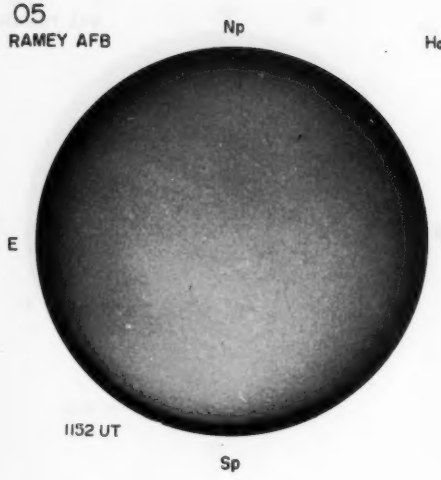




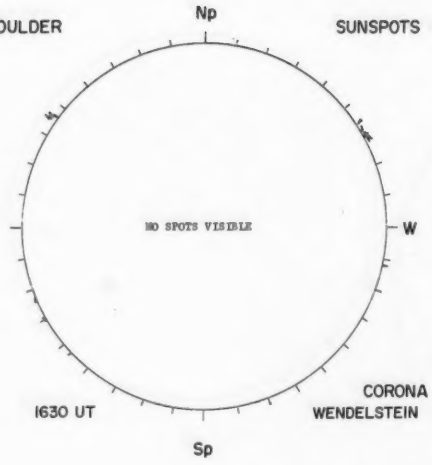


05

RAMEY AFB



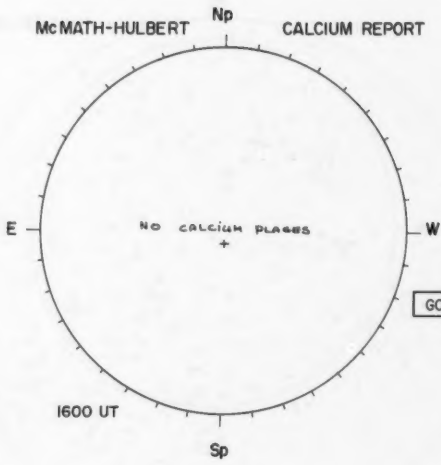
Hα BOULDER



SUNSPOTS

CORONA
WENDELSTEIN

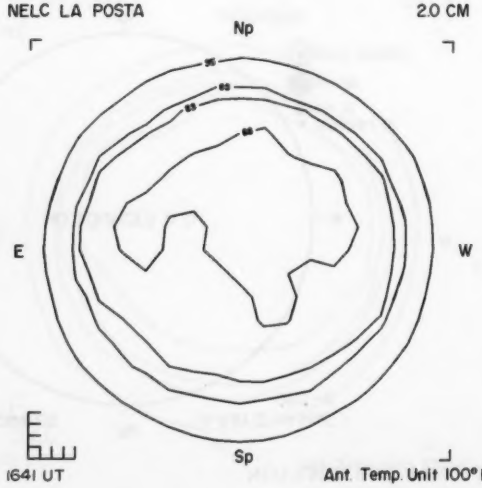
McMATH-HULBERT



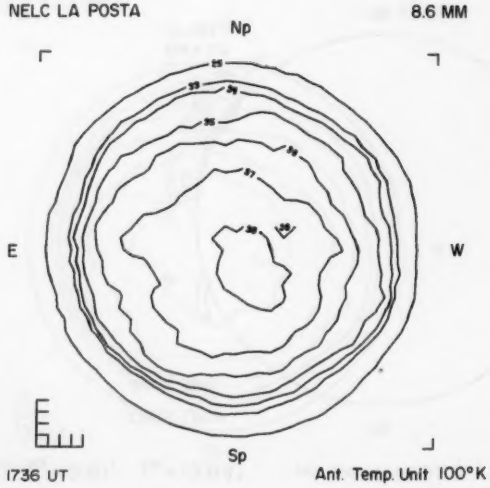
CALCIUM REPORT

GOOD | M

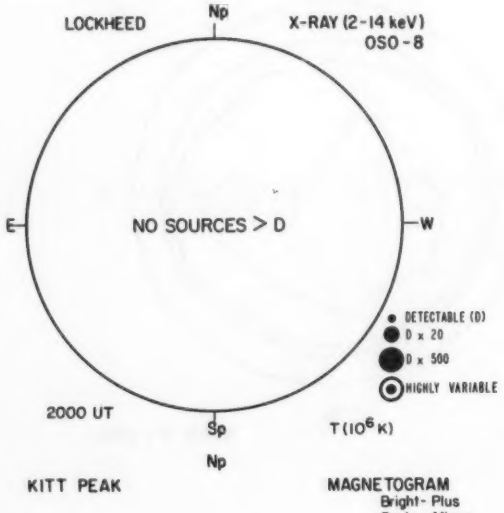
NELC LA POSTA 2.0 CM



NELC LA POSTA 8.6 MM

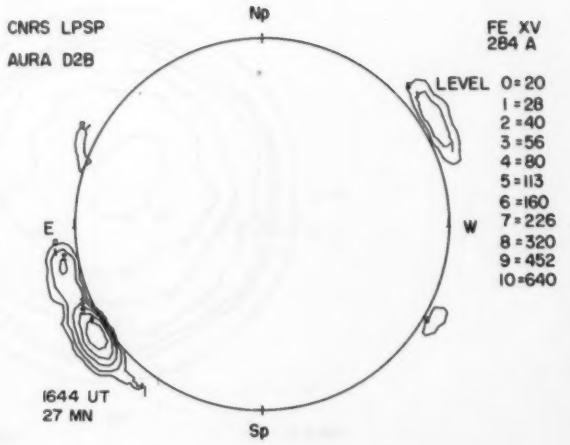


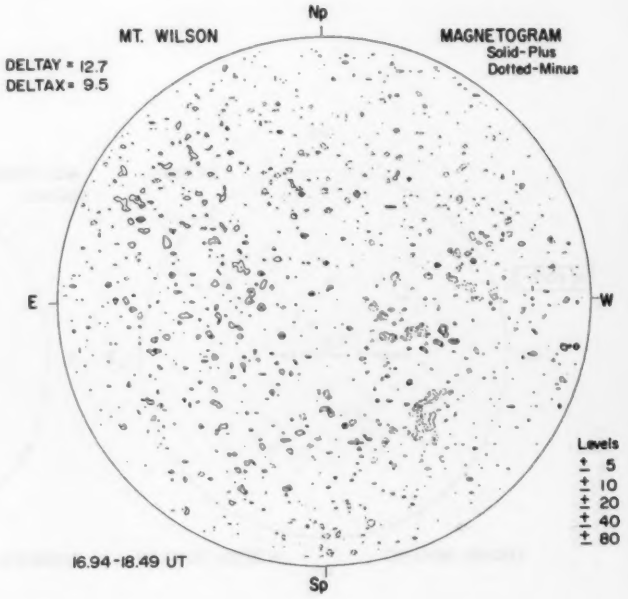
NOVEMBER 6, 1976 (P = 23.58, B_o = 3.81, L_o = 15.84)



KITT PEAK

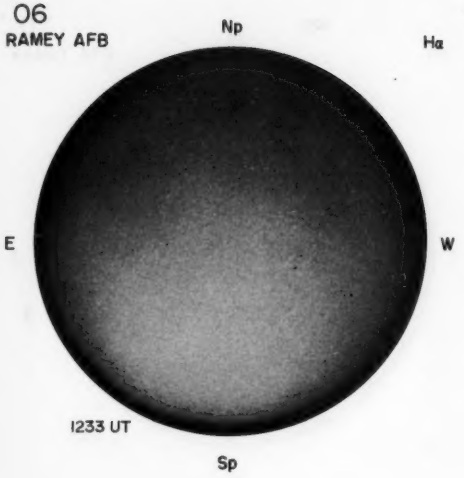
MAGNETOGRAM
Bright - Plus
Dark - Minus



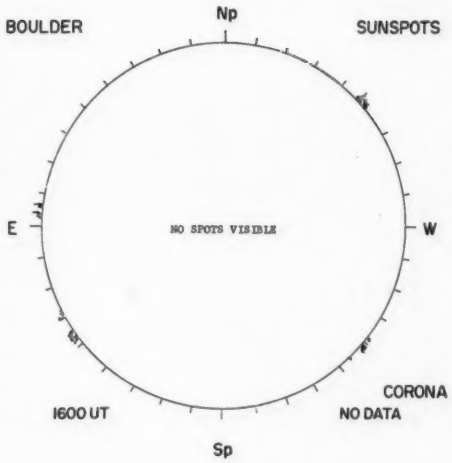


06

RAMEY AFB



Hα BOULDER

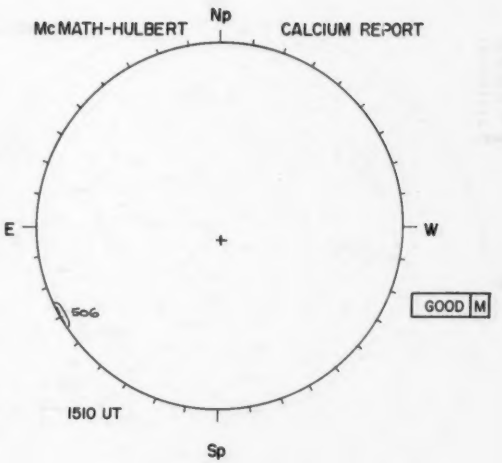


SUNSPOTS

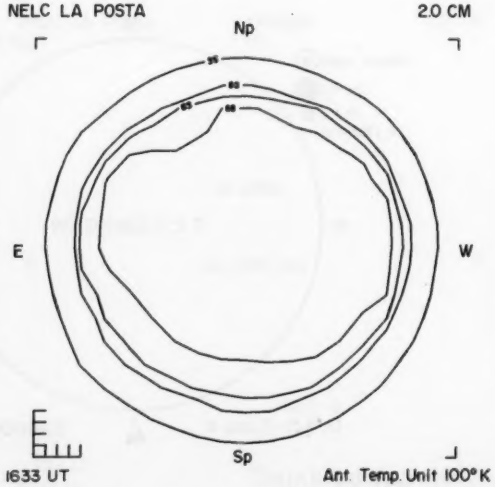
CORONA

NO DATA

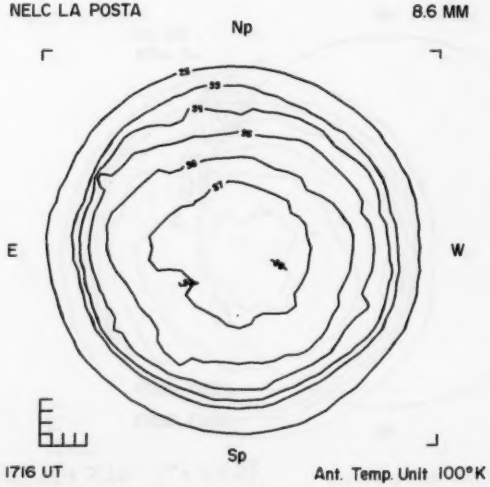
McMATH-HULBERT CALCIUM REPORT



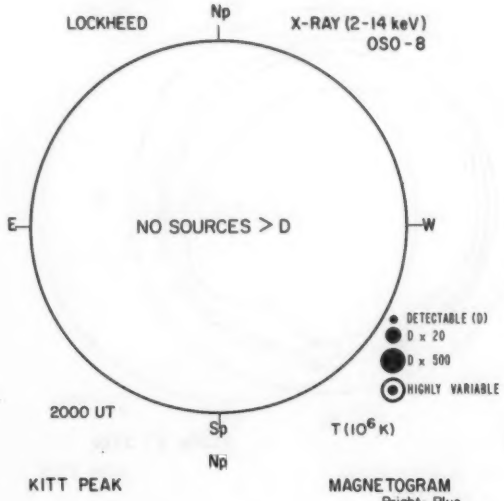
NELC LA POSTA 2.0 CM



NELC LA POSTA 8.6 MM

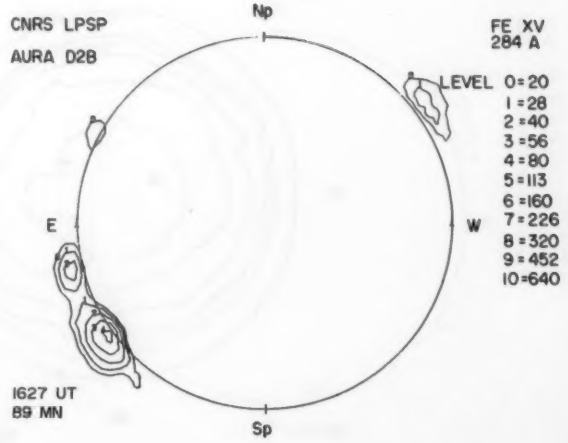


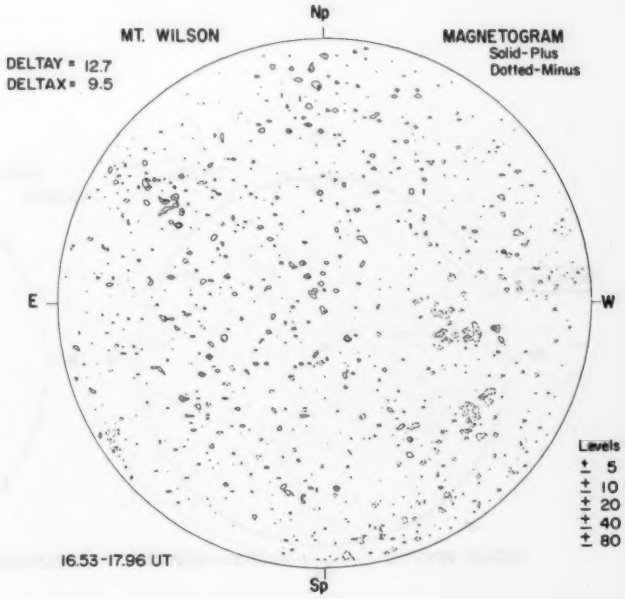
NOVEMBER 7, 1976 (P = 23.37, B_o = 3.70, L_o = 2.65)



KITT PEAK

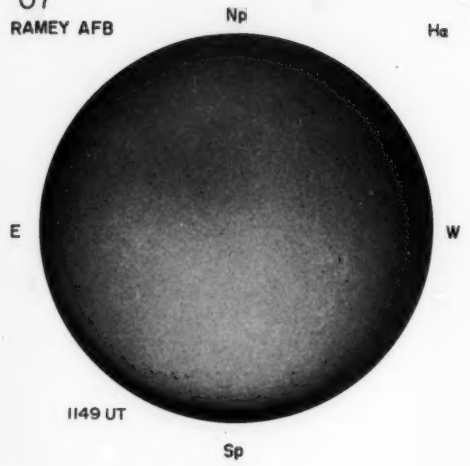
MAGNETOGRAM
Bright - Plus
Dark - Minus



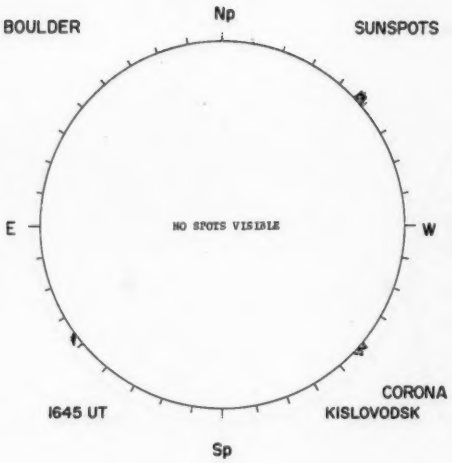


07

RAMEY AFB



BOULDER

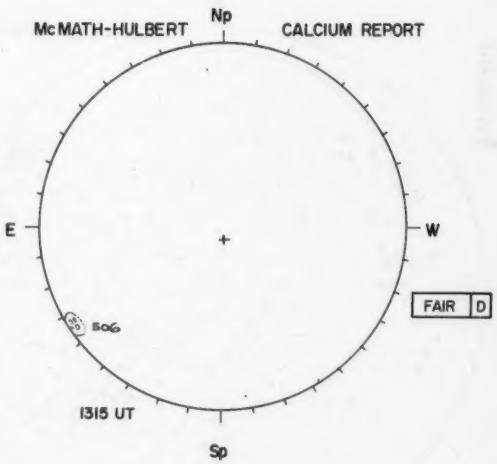


SUNSPOTS

CORONA

KISLOVODSK

McMATH-HULBERT

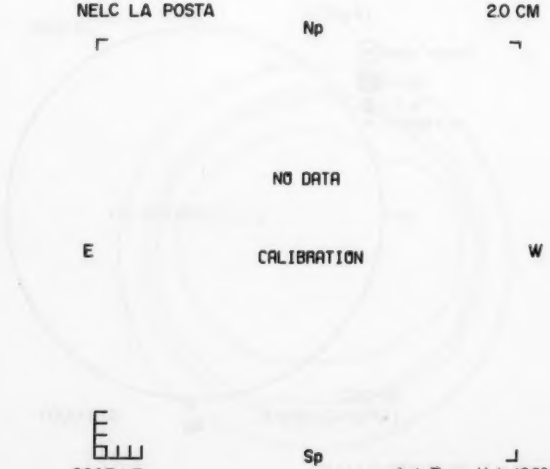


CALCIUM REPORT

FAIR D

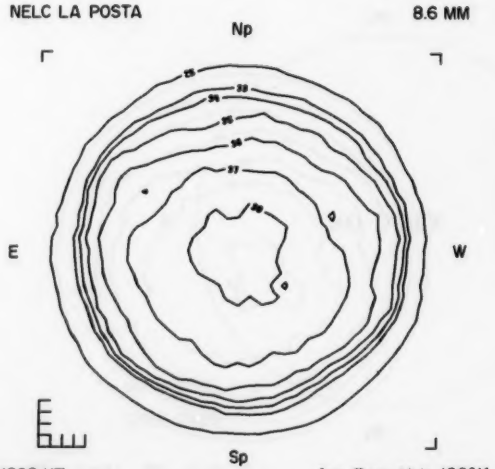
NELC LA POSTA

2.0 CM



NELC LA POSTA

8.6 MM



NOVEMBER 8, 1976 (P = 23.15, B_o = 3.59, L_o = 349.47)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

Np

E — NO SOURCES > D — W

DETECTABLE (D)
D x 20
D x 500
HIGHLY VARIABLE

0400 UT

Sp

T (10^6 K)

Np

KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

CNRS LPSP

AURA D2B

Np

FE XV
284 A

LEVEL 0 = 20
1 = 28
2 = 40
3 = 56
4 = 80
5 = 113
6 = 160
7 = 226
8 = 320
9 = 452
10 = 640

E — NO DATA — W

Sp

E

W

Sp

Np

MT. WILSON

DELTAY = 12.7
DELTAX = 9.5

MAGNETOGRAM
Solid - Plus
Dotted - Minus

E — W

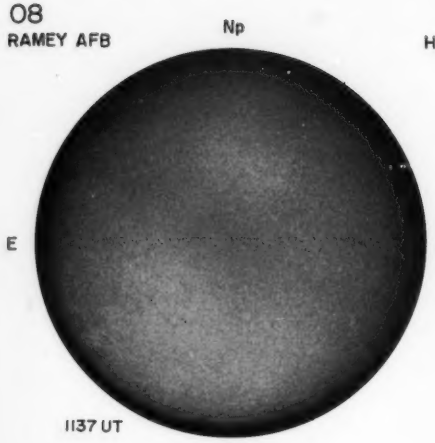
Levels
± 5
± 10
± 20
± 40
± 80

15.78 - 17.21 UT

Sp

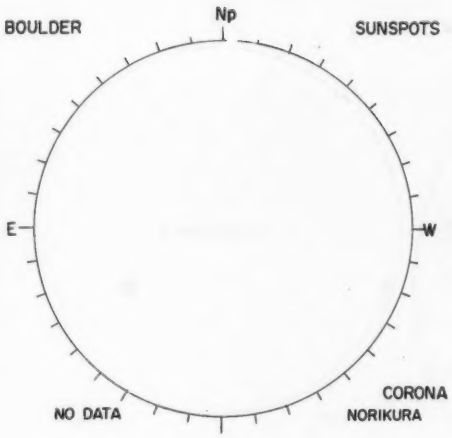
08

RAMEY AFB



1137 UT

Hα BOULDER



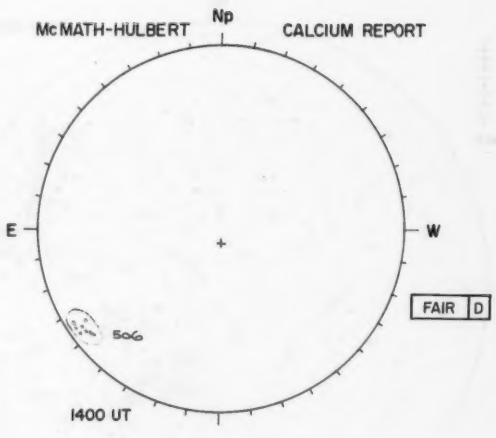
NO DATA

SUNSPOTS

CORONA

NORIKURA

McMATH-HULBERT

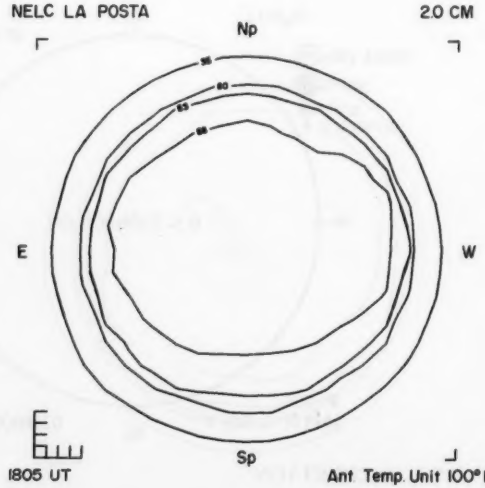


1400 UT

CALCIUM REPORT

FAIR D

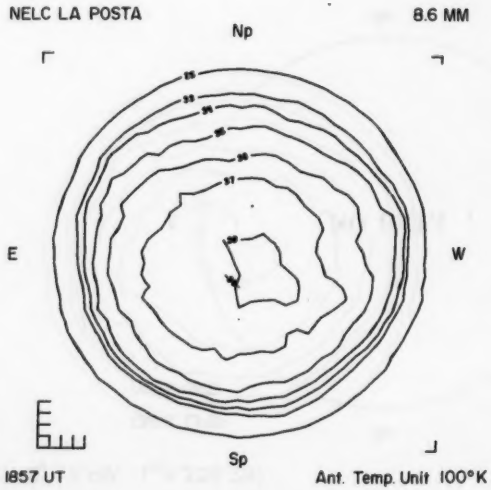
NELC LA POSTA 2.0 CM



1805 UT

Ant. Temp. Unit 100°K

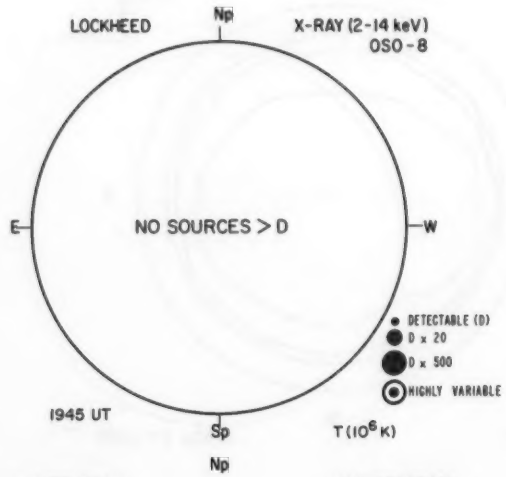
NELC LA POSTA 8.6 MM



1857 UT

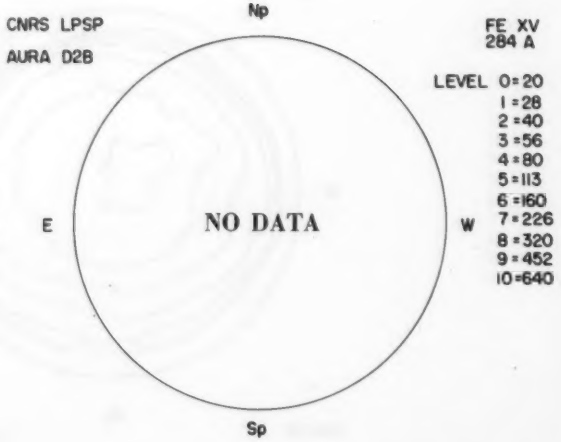
Ant. Temp. Unit 100°K

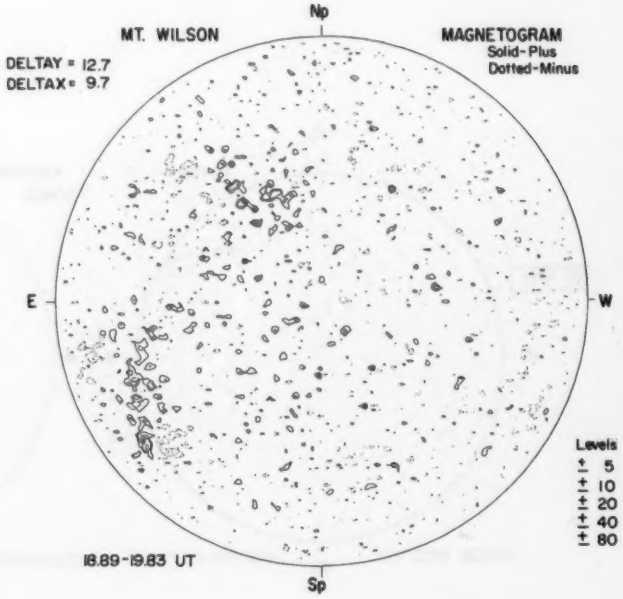
NOVEMBER 9, 1976 (P = 22.92, B_o = 3.48, L_o = 336.28)



KITT PEAK

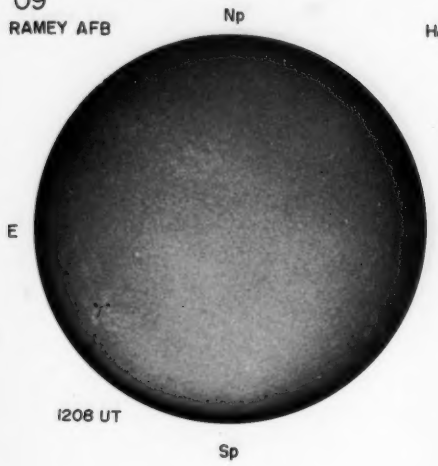
MAGNETOGRAM
Bright - Plus
Dark - Minus





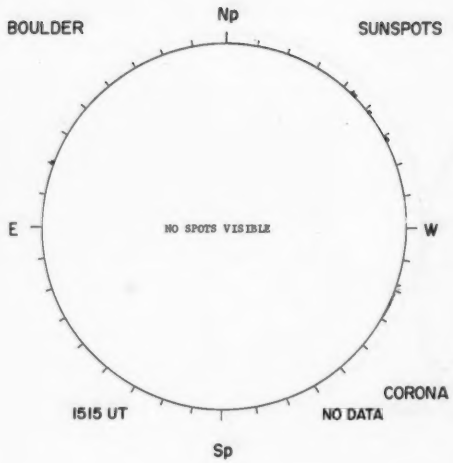
09

RAMEY AFB



1208 UT

Hα BOULDER



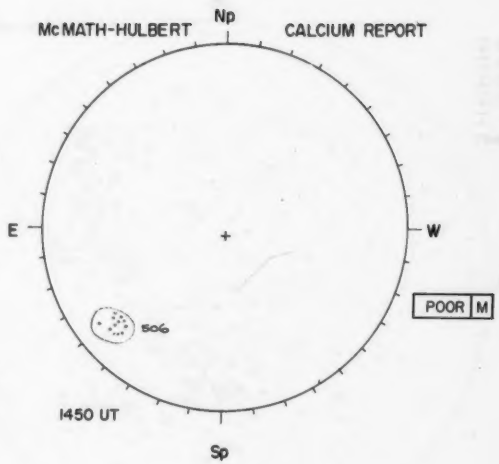
1515 UT

SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT

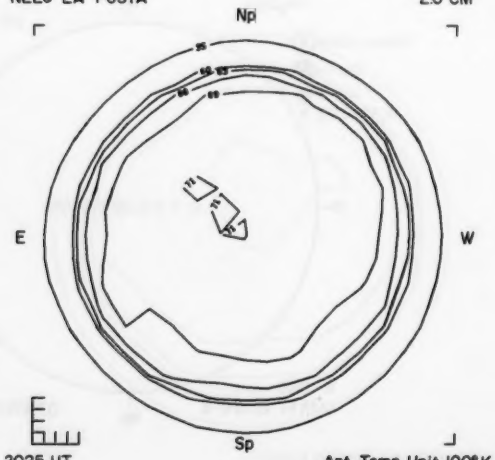


1450 UT

CALCIUM REPORT

POOR	M

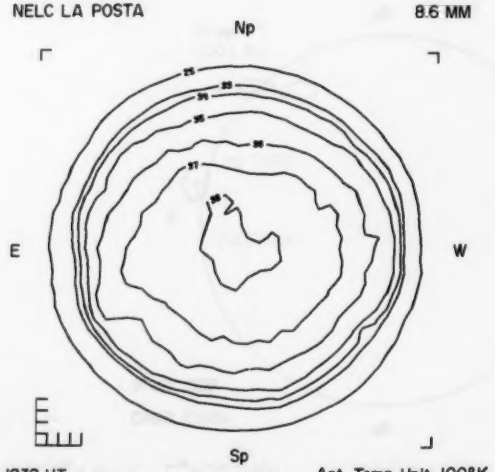
NELC LA POSTA 2.0 CM



2025 UT

Ant. Temp. Unit 100°K

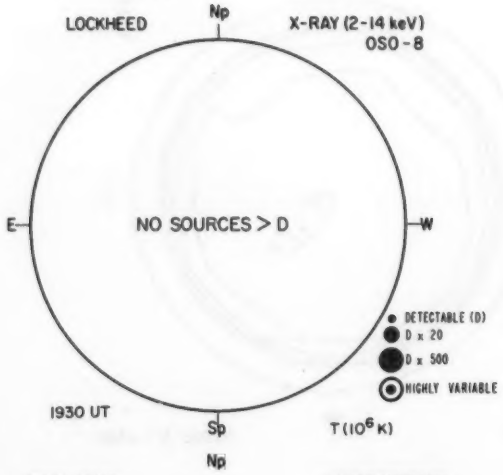
NELC LA POSTA 8.6 MM



1838 UT

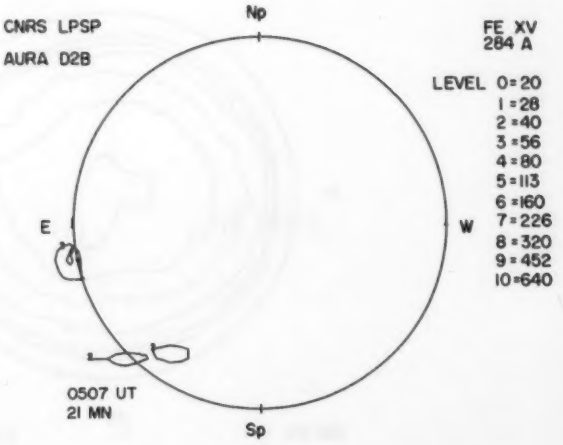
Ant. Temp. Unit 100°K

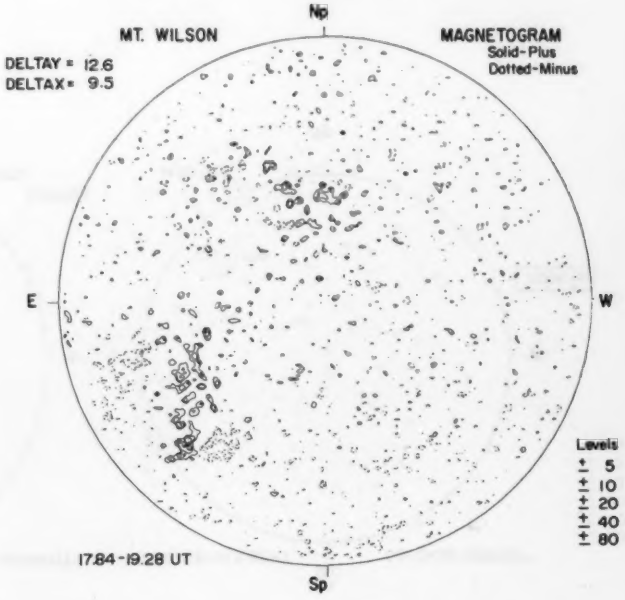
NOVEMBER 10, 1976 (P = 22.69, B_0 = 3.37, L_0 = 323.10)



KITT PEAK

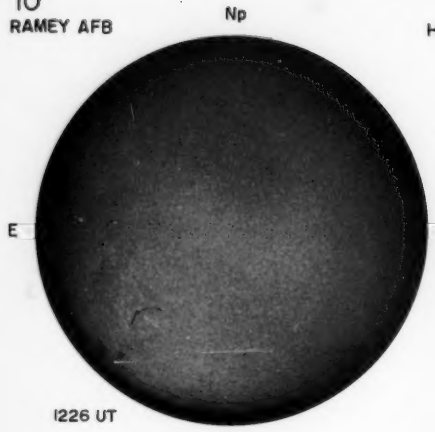
MAGNETOGRAM
Bright - Plus
Dark - Minus





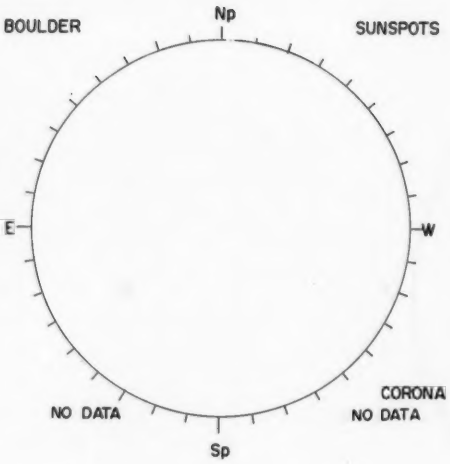
10

RAMEY AFB



1226 UT

Hα BOULDER



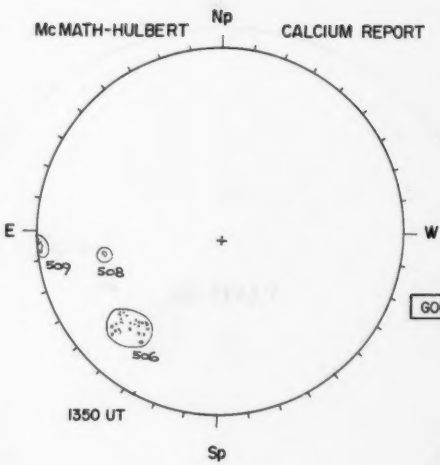
NO DATA

SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT



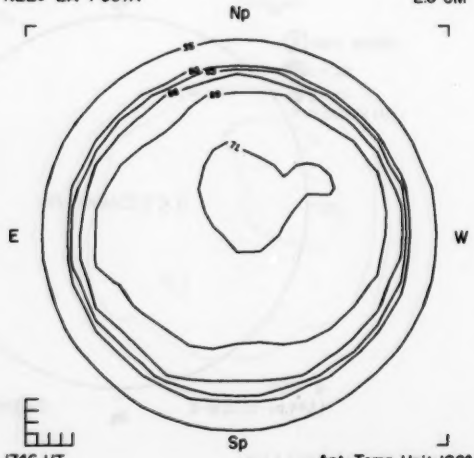
1350 UT

CALCIUM REPORT

GOOD | M

NELC LA POSTA

2.0 CM



1746 UT

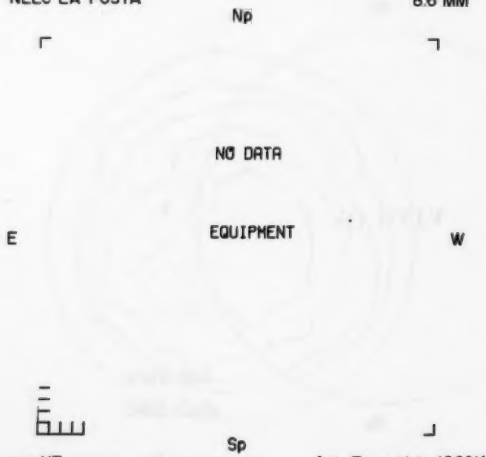
Ant. Temp. Unit 100°K

NELC LA POSTA

8.6 MM

NO DATA

EQUIPMENT



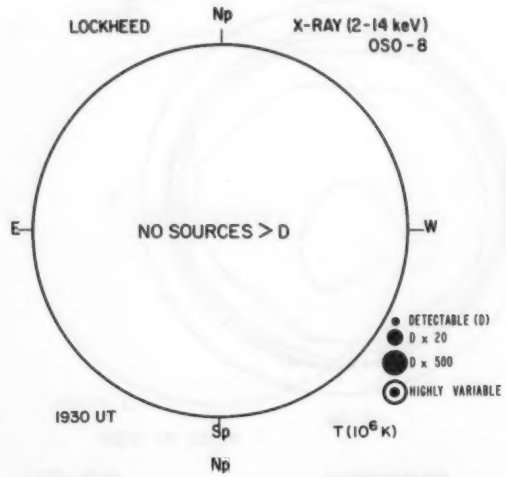
---- UT

Ant. Temp. Unit 100°K

NOVEMBER 11, 1976 (P = 22.44, B_o = 3.25, L_o = 309.92)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

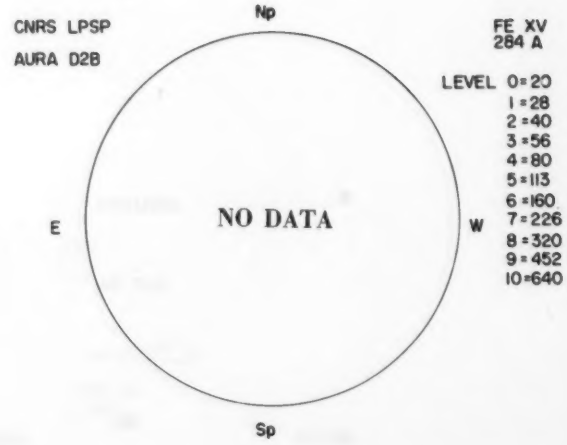


KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

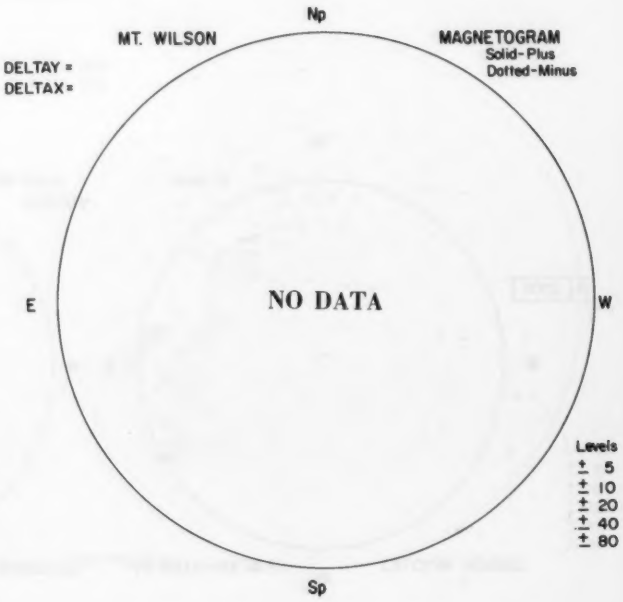
CNRS LPSP
AURA D2B

FE XV
284 A

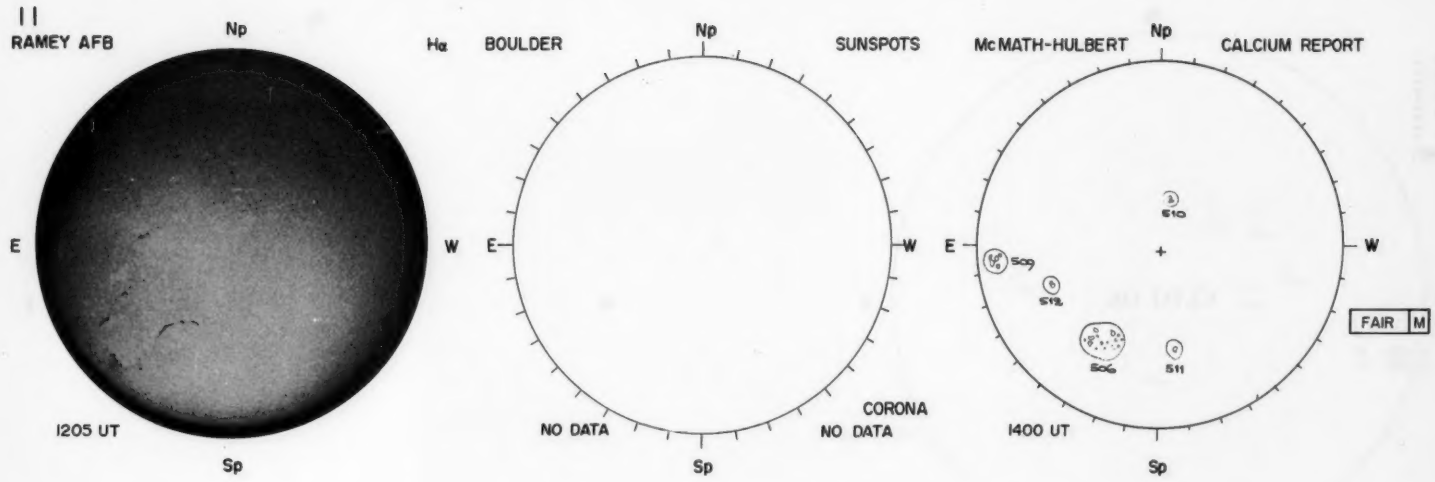


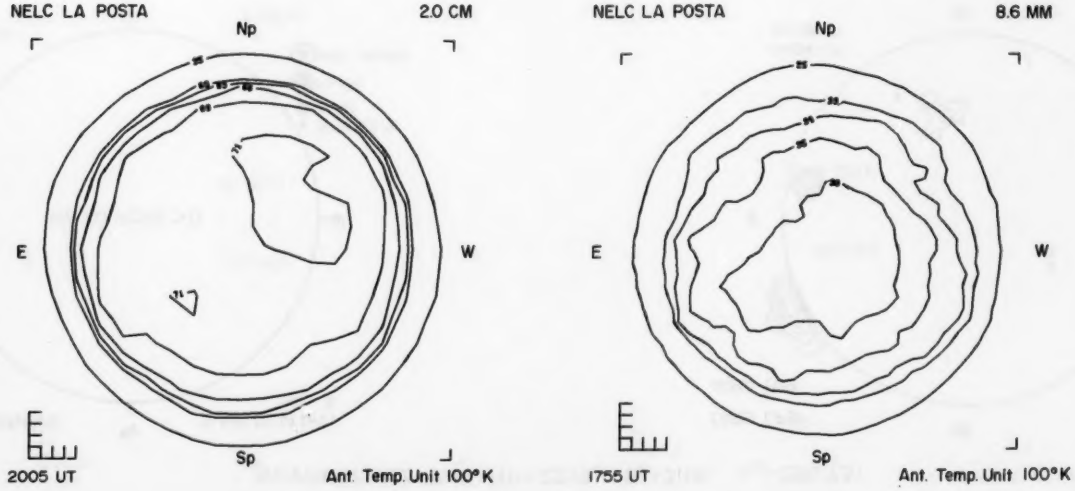
MT. WILSON

DELTAY =
DELTAX =



MAGNETOGRAM
Solid - Plus
Dotted - Minus

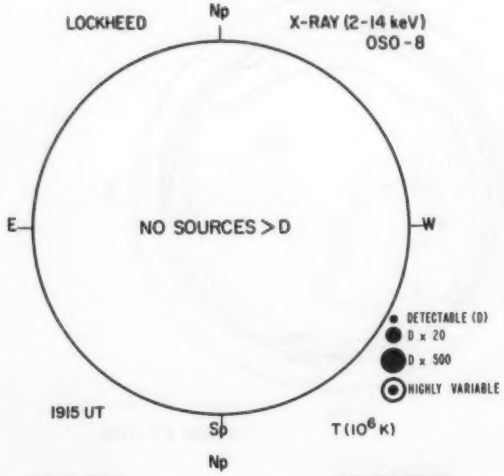

RAMEY AFB
Np
E
W
Sp
1205 UT
Hα
BOULDER
Np
E
W
Sp
NO DATA
NO DATA
SUNSPOTS
CORONA
McMATH-HULBERT
Np
E
W
Sp
1400 UT
CALCIUM REPORT
510
509
512
506
511
FAIR
M


NELC LA POSTA
2.0 CM
Np
E
W
Sp
2005 UT
Ant. Temp. Unit 100°K
NELC LA POSTA
8.6 MM
Np
E
W
Sp
1755 UT
Ant. Temp. Unit 100°K

NOVEMBER 12, 1976 (P = 22.19, B_o = 3.14, L_o = 296.73)

LOCKHEED

X-RAY (2-14 keV)
OSO-8



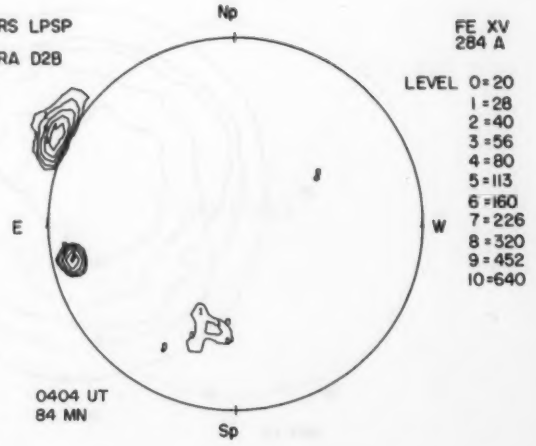
KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

CNRS LPSP
AURA D2B

FE XV
284 A

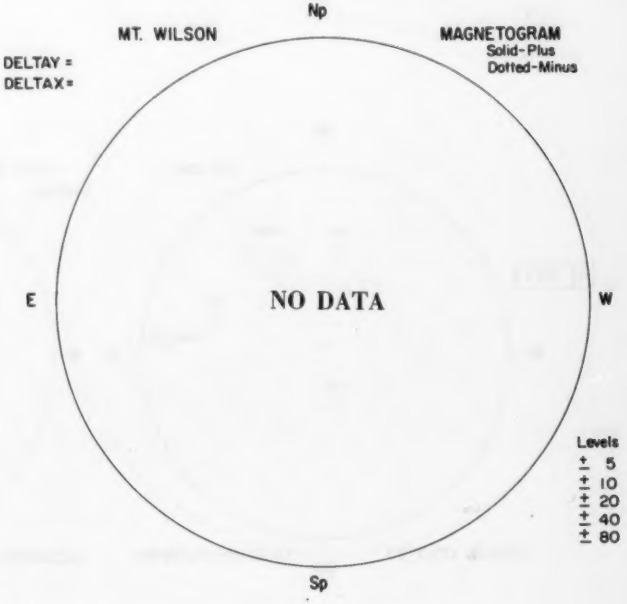
LEVEL 0 = 20
1 = 28
2 = 40
3 = 56
4 = 80
5 = 113
6 = 160
7 = 226
8 = 320
9 = 452
10 = 640



MT. WILSON

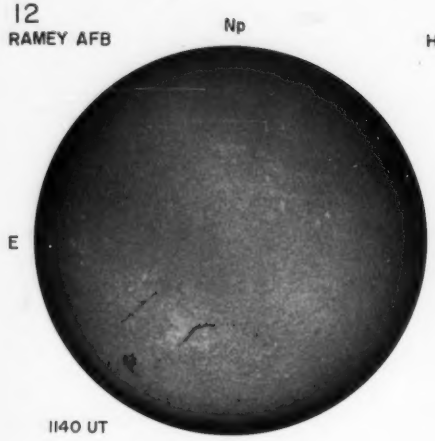
DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus



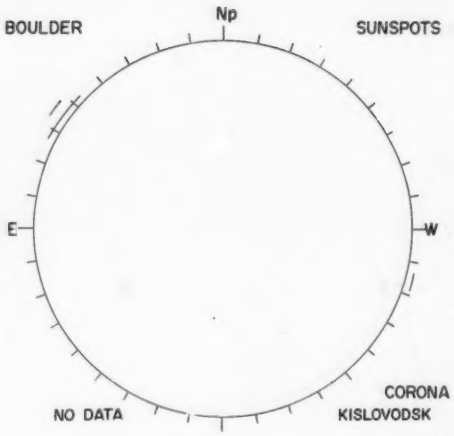
12

RAMEY AFB



Hα

BOULDER



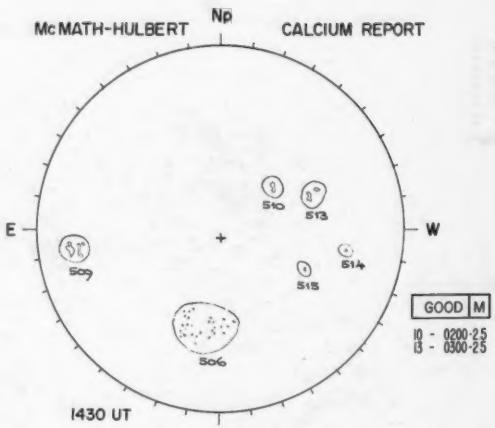
SUNSPOTS

CORONA

KISLOVODSK

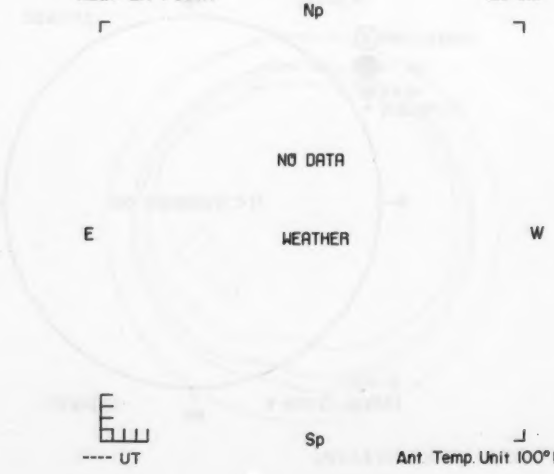
McMATH-HULBERT

CALCIUM REPORT



NELC LA POSTA

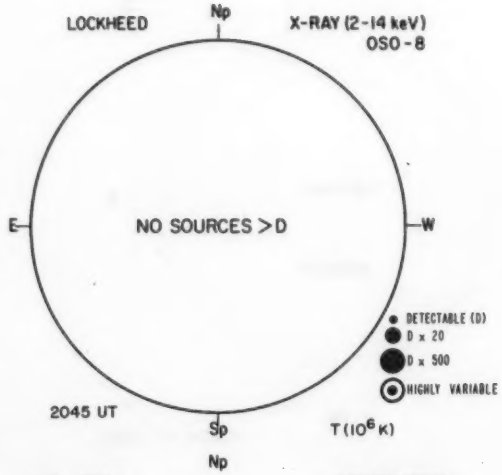
2.0 CM



NELC LA POSTA

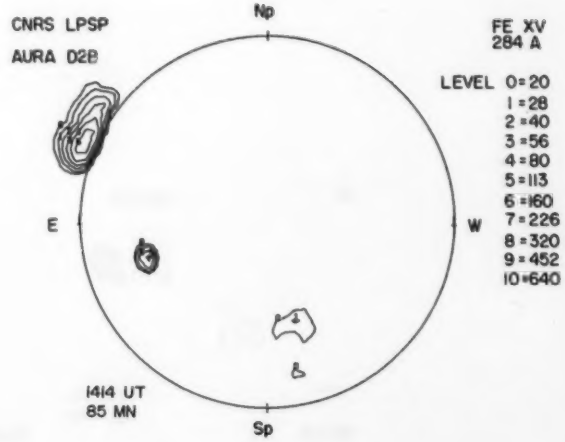
8.6 MM

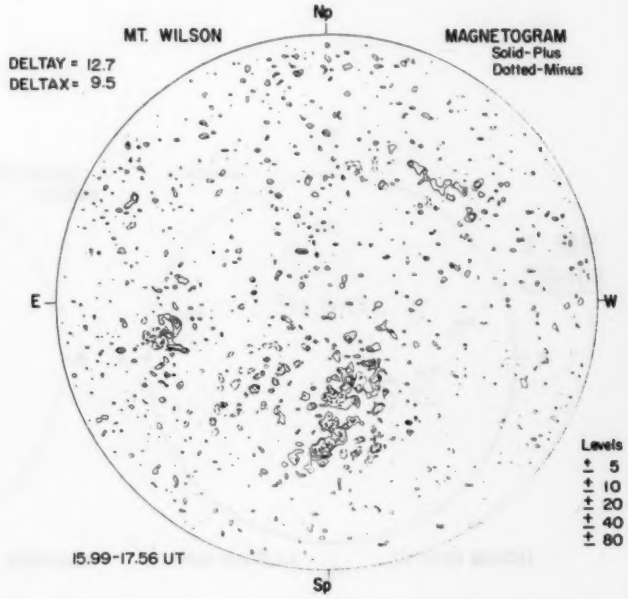
NOVEMBER 13, 1976 (P = 21.94, B_0 = 3.02, L_0 = 283.55)



KITT PEAK

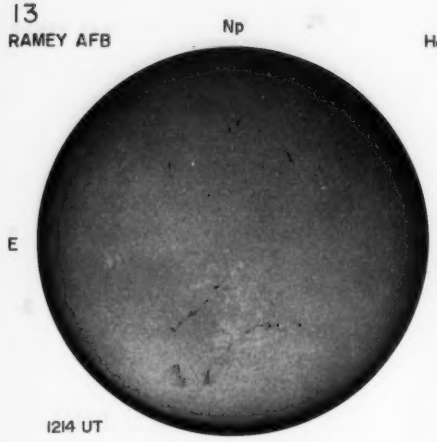
MAGNETOGRAM
Bright - Plus
Dark - Minus





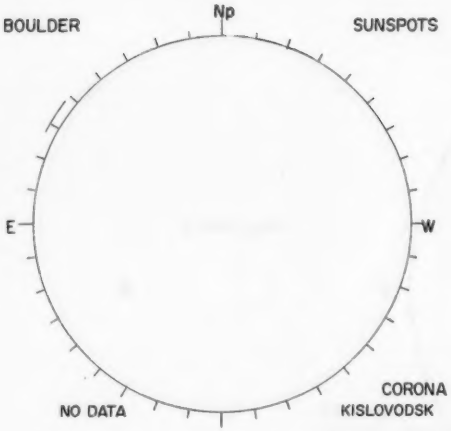
13

RAMEY AFB



1214 UT

Hα BOULDER



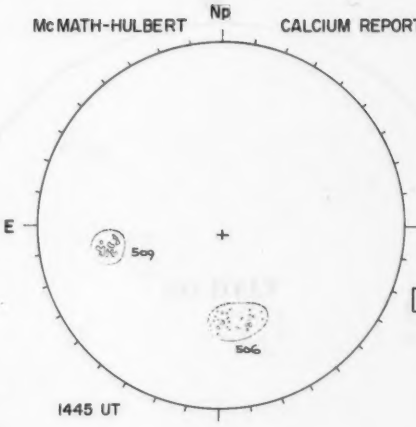
NO DATA

SUNSPOTS

CORONA

KISLOVODSK

McMATH-HULBERT

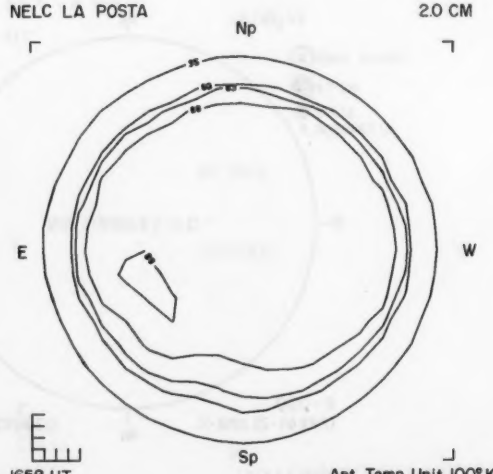


1445 UT

CALCIUM REPORT

FAIR | M

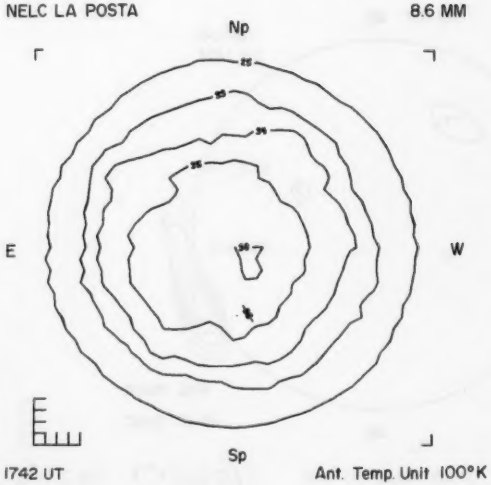
NELC LA POSTA 2.0 CM



1658 UT

Ant. Temp. Unit 100°K

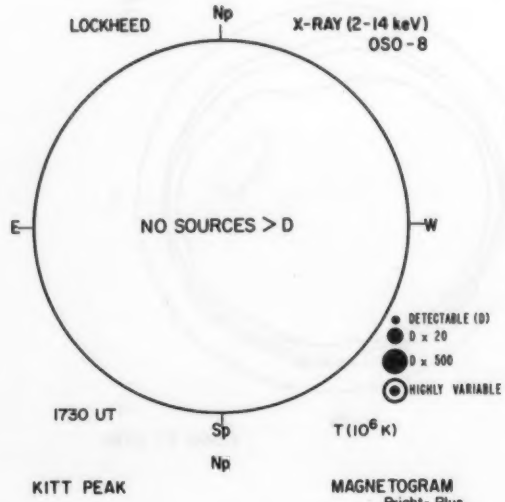
NELC LA POSTA 8.6 MM



1742 UT

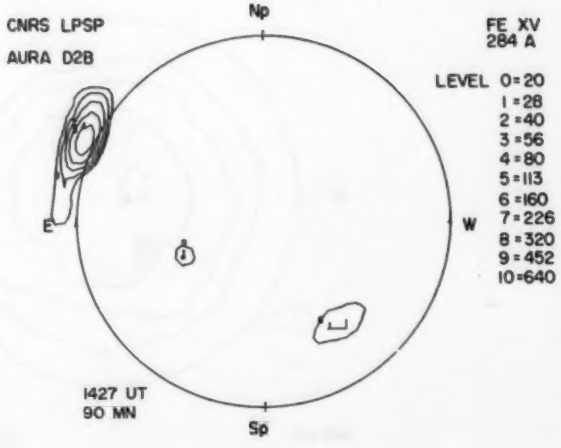
Ant. Temp. Unit 100°K

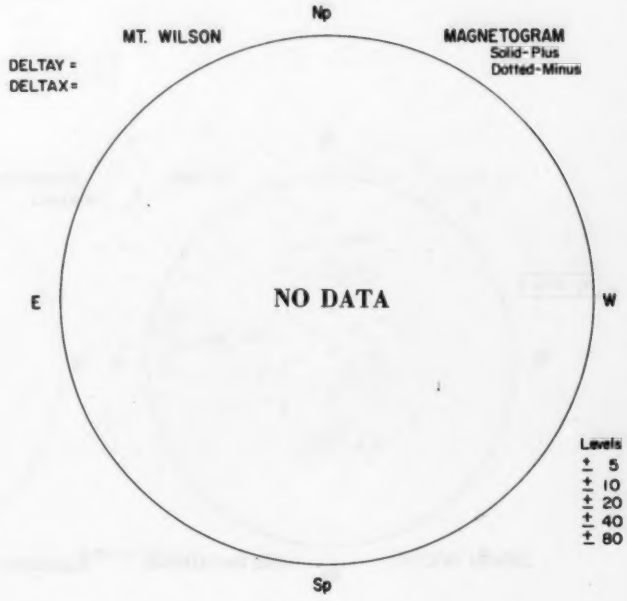
NOVEMBER 14, 1976 (P = 21.67, B_0 = 2.91, L_0 = 270.37)



KITT PEAK

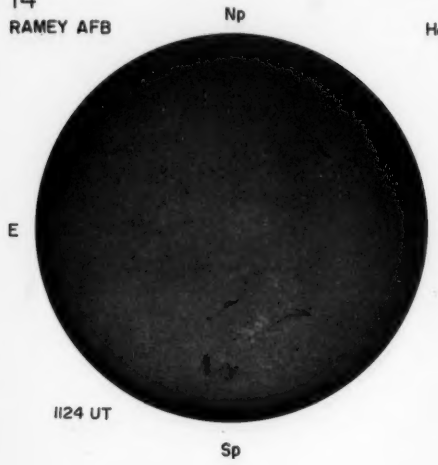
MAGNETOGRAM
Bright - Plus
Dark - Minus



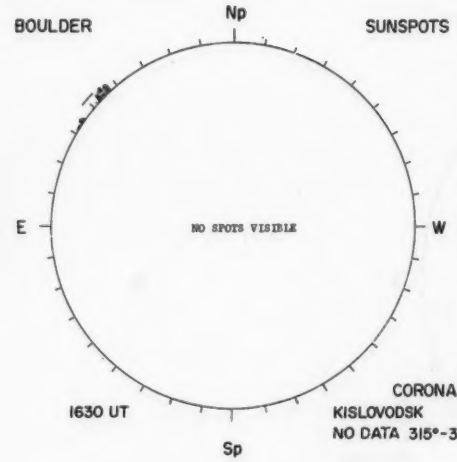


14

RAMEY AFB



Hα BOULDER



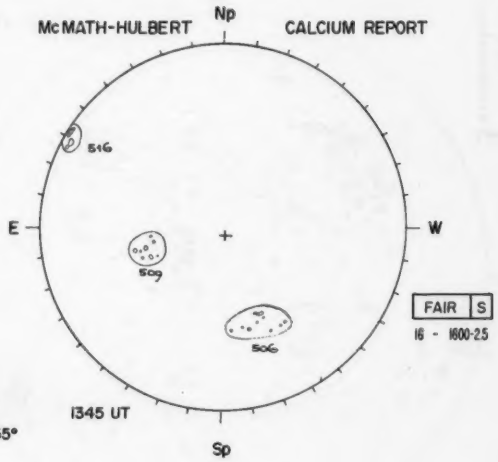
SUNSPOTS

CORONA

KISLOVODSK

NO DATA 315°-355°

McMATH-HULBERT

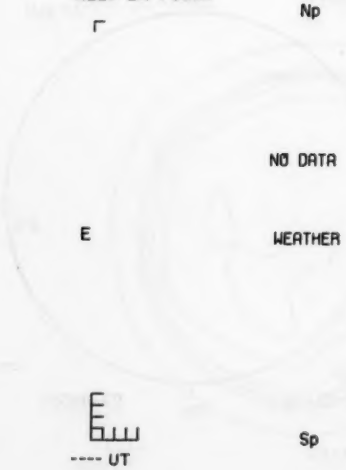


CALCIUM REPORT

FAIR | S

16 - 1600-25

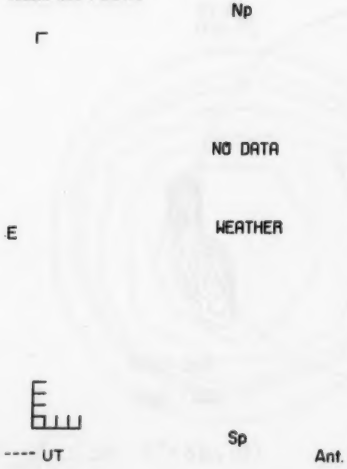
NELC LA POSTA



2.0 CM

Ant. Temp. Unit 100°K

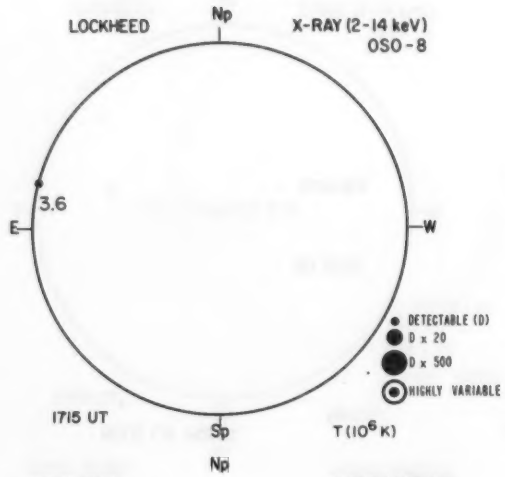
NELC LA POSTA



8.6 MM

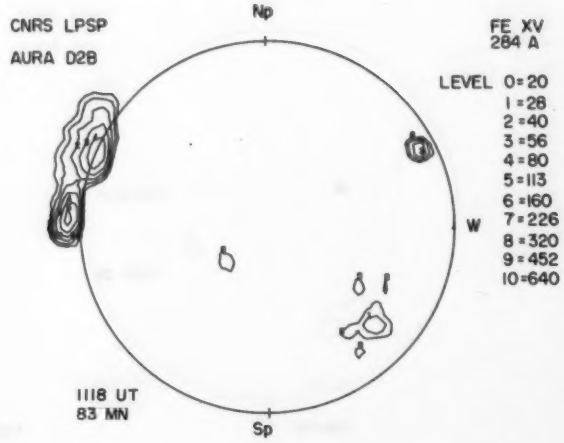
Ant. Temp. Unit 100°K

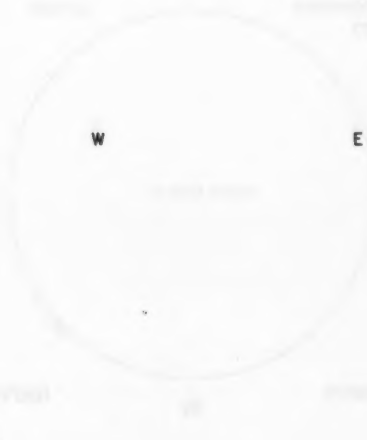
NOVEMBER 15, 1976 (P = 21.40, B_0 = 2.79, L_0 = 257.18)

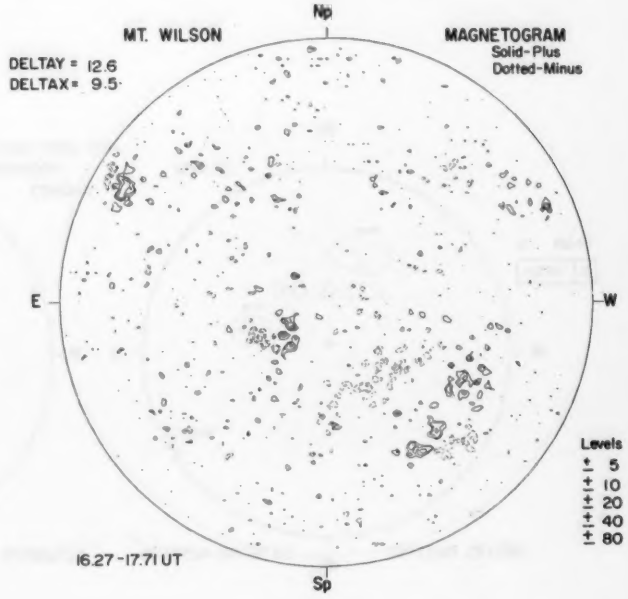


KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

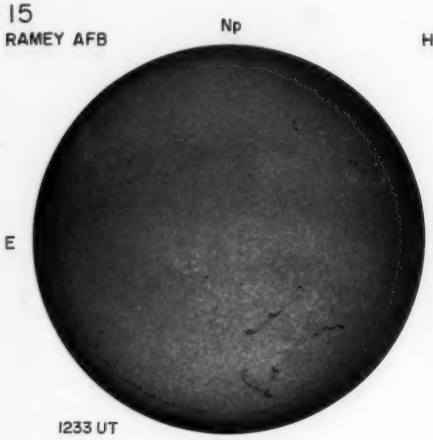






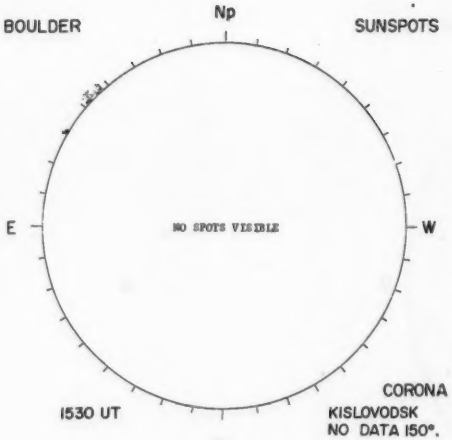
15

RAMEY AFB



1233 UT

Hα BOULDER

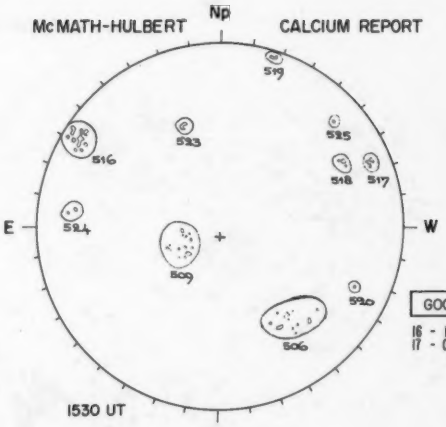


1530 UT

SUNSPOTS

CORONA
KISLOVODSK
NO DATA 150°.
300°-355°

McMATH-HULBERT



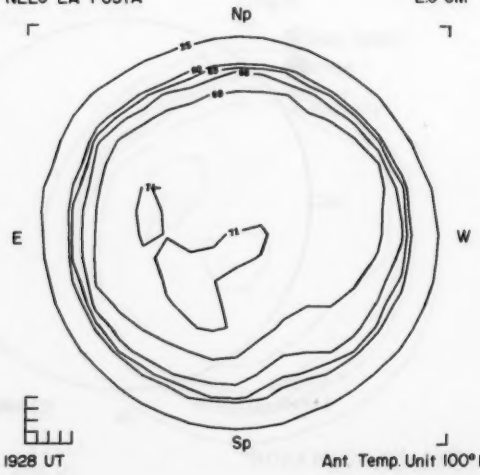
1530 UT

CALCIUM REPORT

GOOD	S

16 - 1600-2.5
17 - 0300 3.0

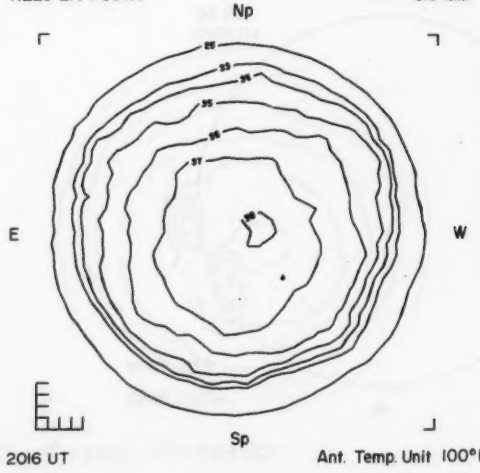
NELC LA POSTA 2.0 CM



1928 UT

Ant. Temp. Unit 100°K

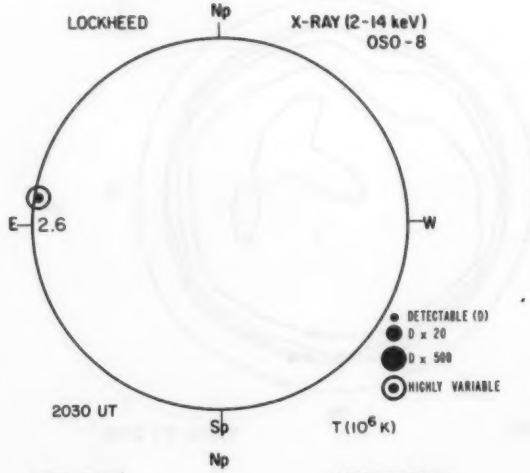
NELC LA POSTA 8.6 MM



2016 UT

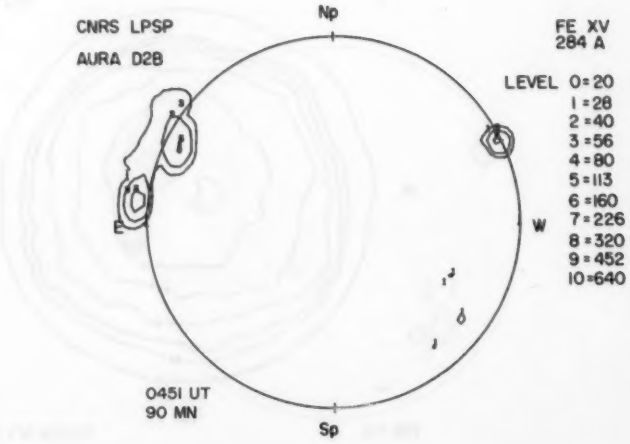
Ant. Temp. Unit 100°K

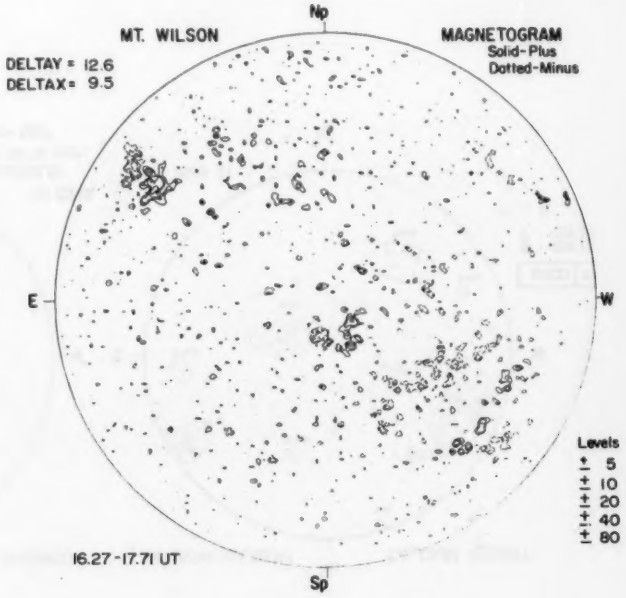
NOVEMBER 16, 1976 (P = 21.12, B_0 = 2.67, L_0 = 244.00)



KITT PEAK

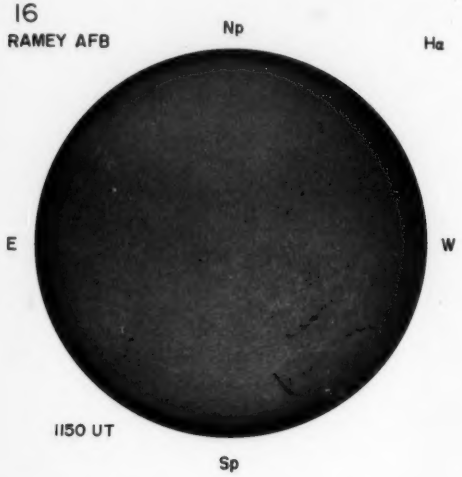
MAGNETOGRAM
Bright - Plus
Dark - Minus





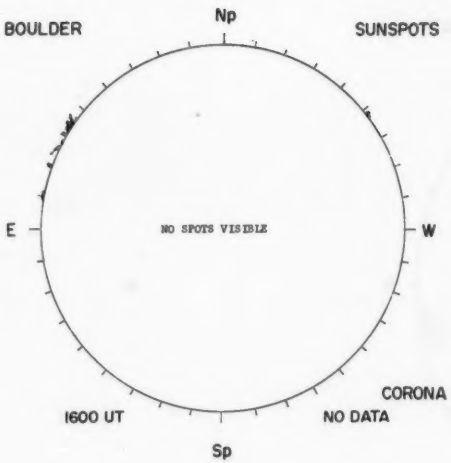
16

RAMEY AFB



1150 UT

Hα BOULDER



1600 UT

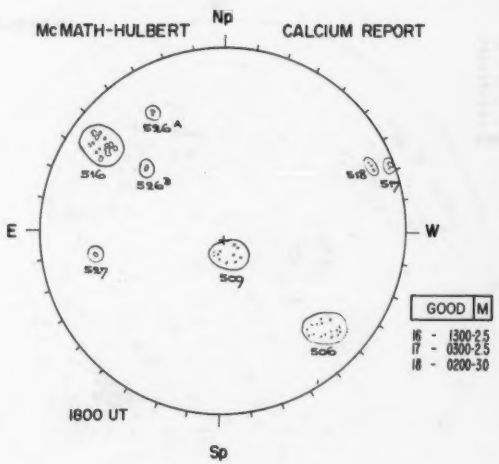
SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT

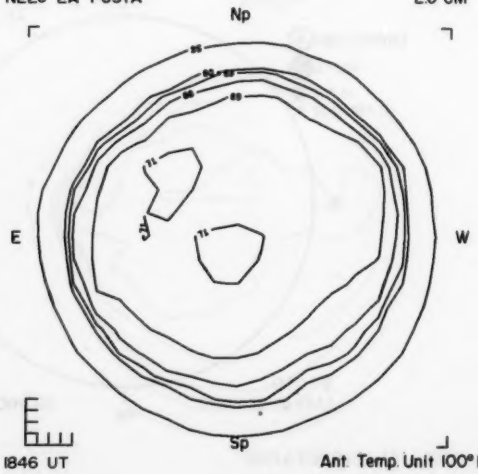
CALCIUM REPORT



1800 UT

GOOD	M
16 - 1300-2.5	
17 - 0300-2.5	
18 - 0200-3.0	

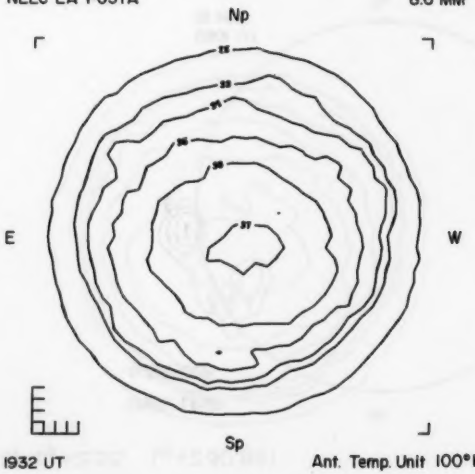
NELC LA POSTA 2.0 CM



1846 UT

Ant. Temp. Unit 100°K

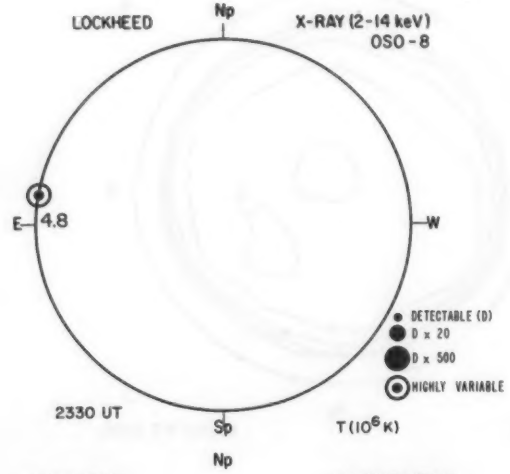
NELC LA POSTA 8.6 MM



1932 UT

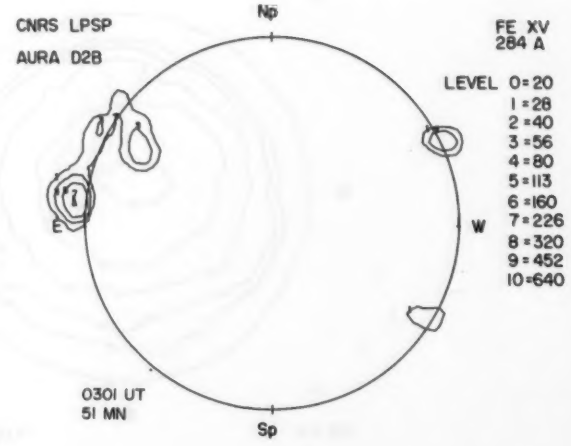
Ant. Temp. Unit 100°K

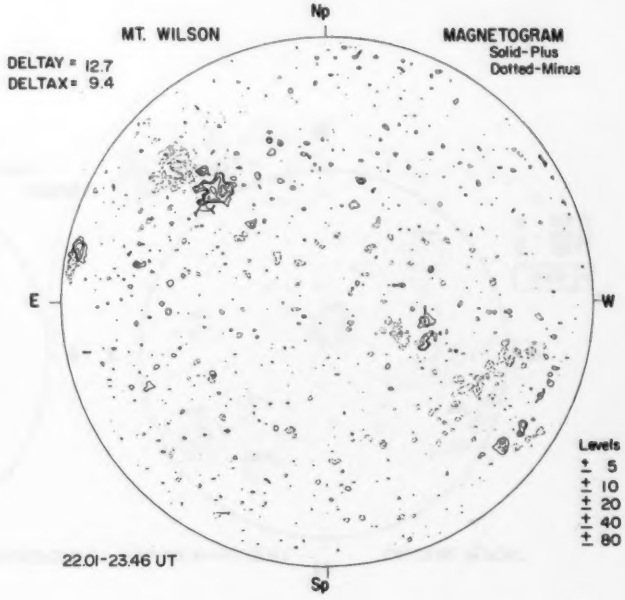
NOVEMBER 17, 1976 (P = 20.83, B_0 = 2.55, L_0 = 230.82)



KITT PEAK

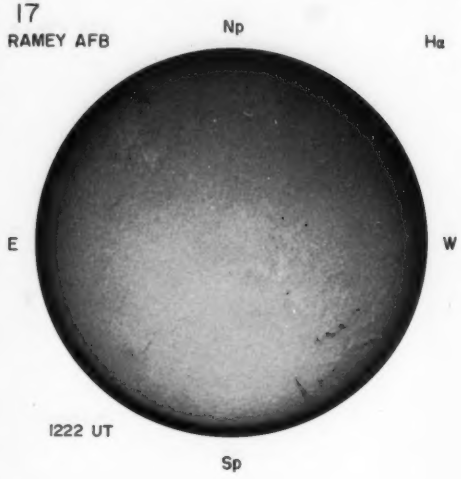
MAGNETOGRAM
Bright - Plus
Dark - Minus





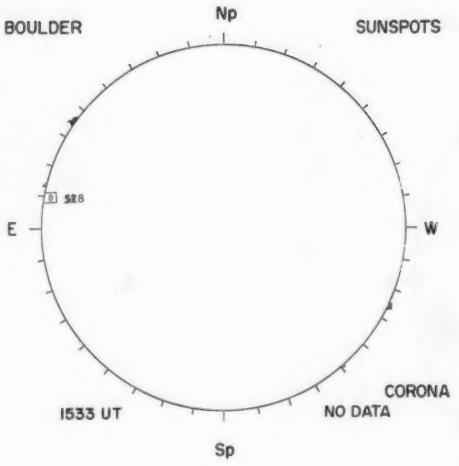
17

RAMEY AFB



1222 UT

Hα BOULDER



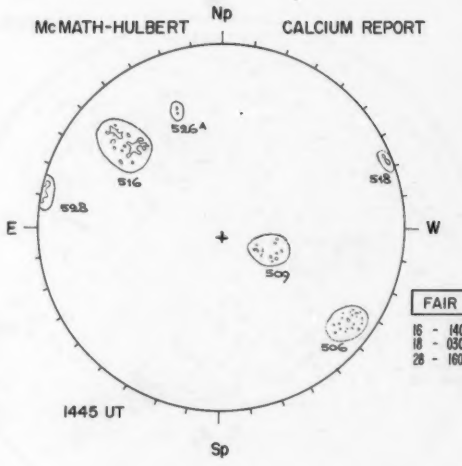
1533 UT

SUNSPOTS

CORONA

NO DATA

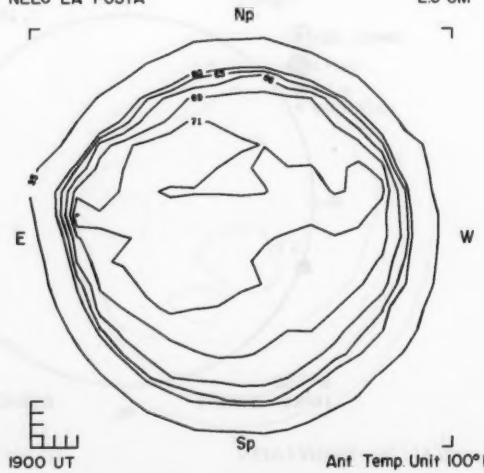
McMATH-HULBERT CALCIUM REPORT



1445 UT

FAIR	M
16 - 1400-30	
18 - 0300-25	
28 - 1600-30	

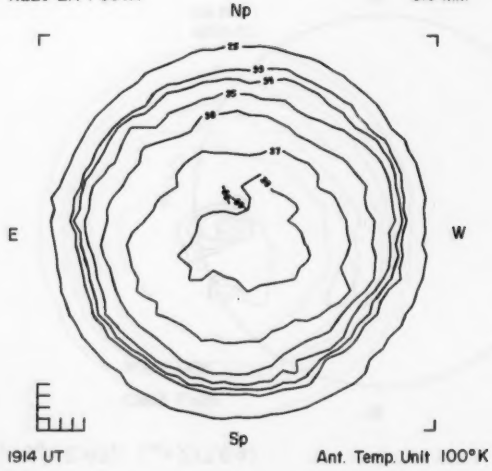
NELC LA POSTA 2.0 CM



1900 UT

Ant. Temp. Unit 100°K

NELC LA POSTA 8.6 MM

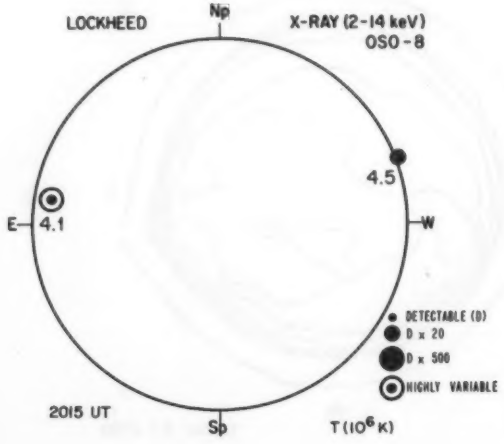


1914 UT

Ant. Temp. Unit 100°K

NOVEMBER 18, 1976 (P = 20.54, B_o = 2.43, L_o = 217.64)

LOCKHEED
X-RAY (2-14 keV)
OSO-8

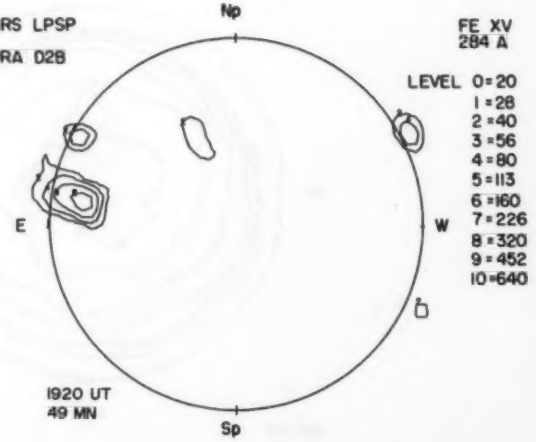


KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

CNRS LPSP
AURA D2B

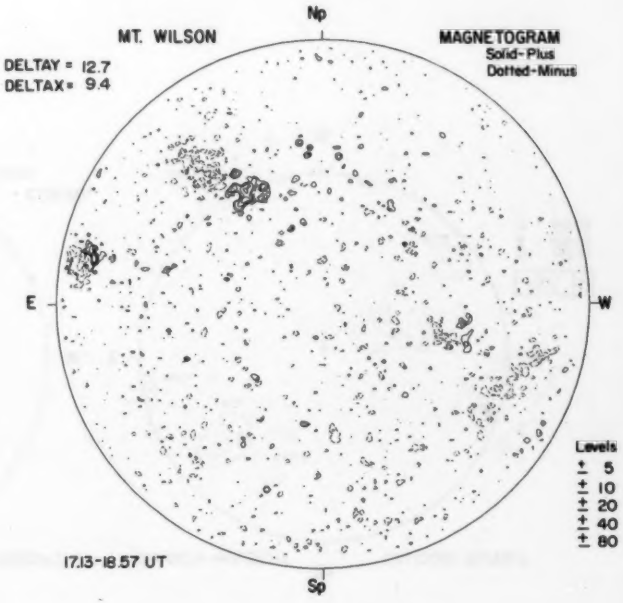
FE XV
284 A



MT. WILSON

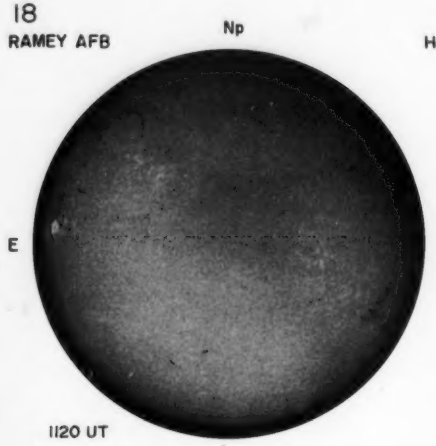
MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.7
DELTAX = 9.4



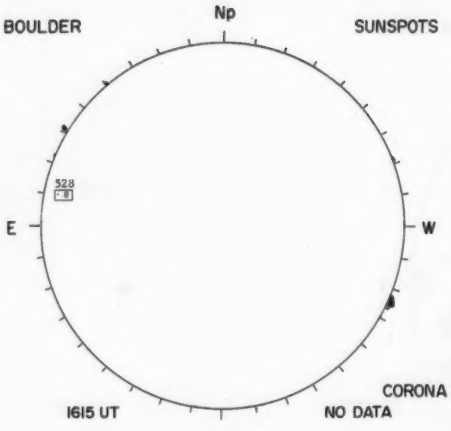
18

RAMEY AFB



1120 UT

Hα BOULDER



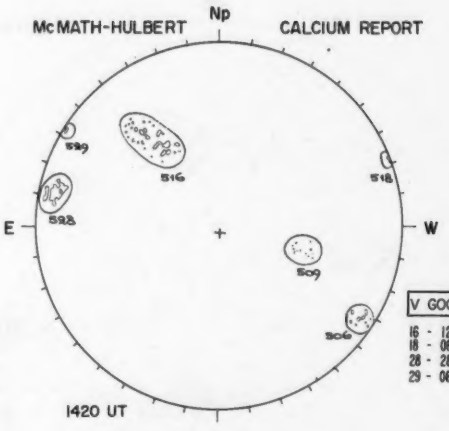
1615 UT

SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT

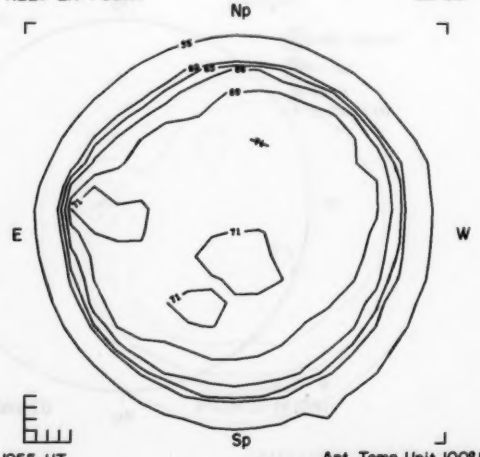


1420 UT

CALCIUM REPORT

V	GOOD	M
16 - 1200-2.5		
18 - 0600-3.0		
28 - 2800-4.0		
29 - 0600-2.5		

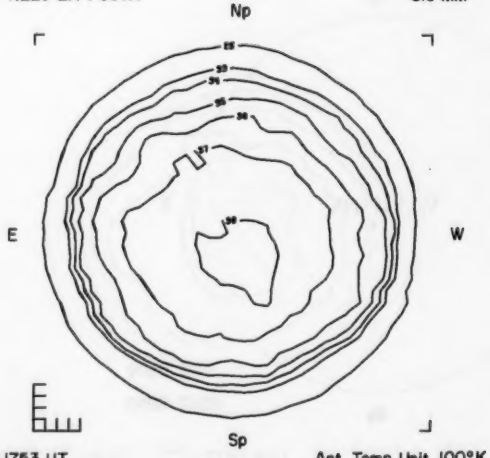
NELC LA POSTA 2.0 CM



1955 UT

Ant. Temp. Unit 100°K

NELC LA POSTA 8.6 MM



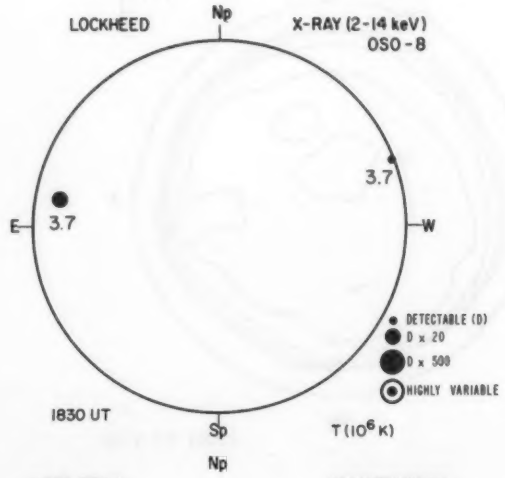
1753 UT

Ant. Temp. Unit 100°K

NOVEMBER 19, 1976 (P = 20.23, B_o = 2.31, L_o = 204.46)

LOCKHEED

X-RAY (2-14 keV)
OSO-8

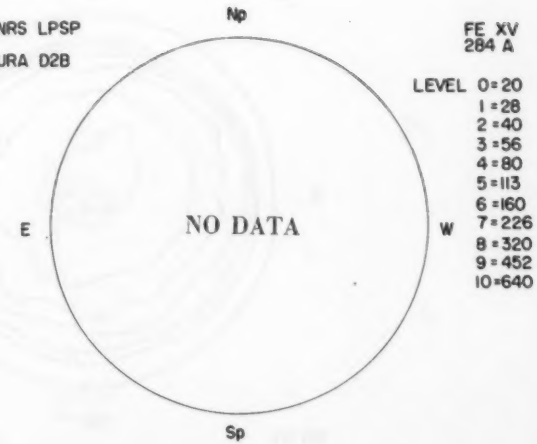


KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

CNRS LPSP
AURA D2B

FE XV
284 A

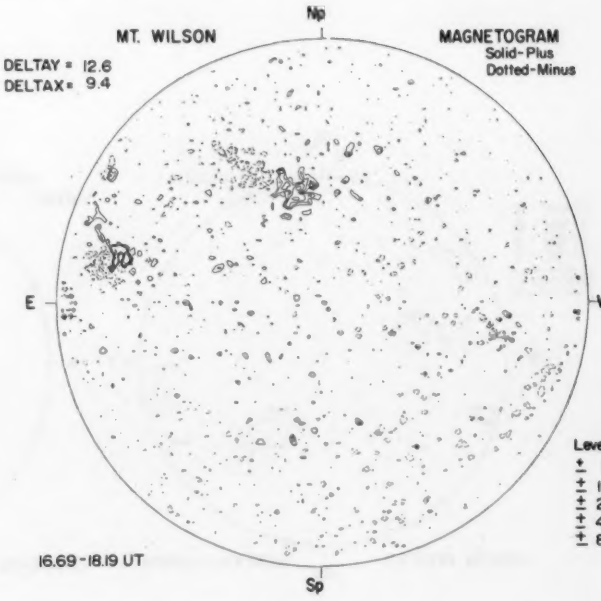


LEVEL 0=20
1=28
2=40
3=56
4=80
5=113
6=160
7=226
8=320
9=452
10=640

MT. WILSON

DELTAY = 12.6
DELTAX = 9.4

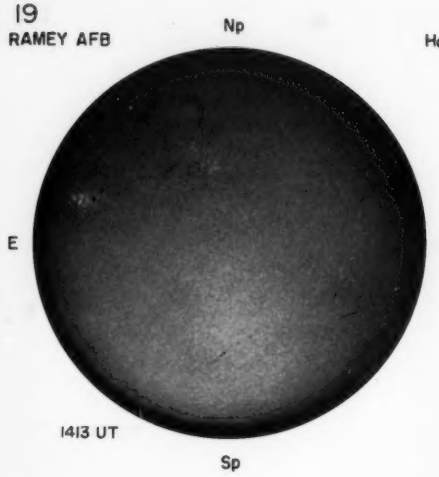
MAGNETOGRAM
Solid - Plus
Dotted - Minus



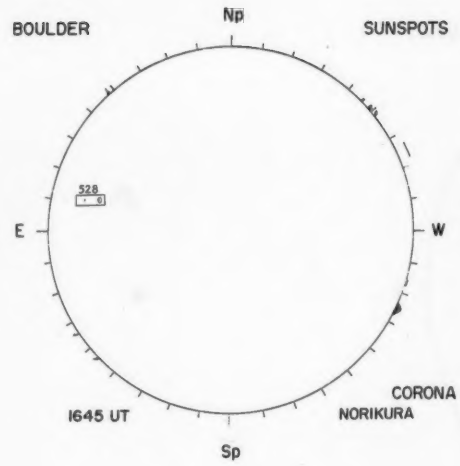
Levels
± 5
± ± 10
± ± ± 20
± ± ± ± 40
± 80

19

RAMEY AFB



Hα BOULDER

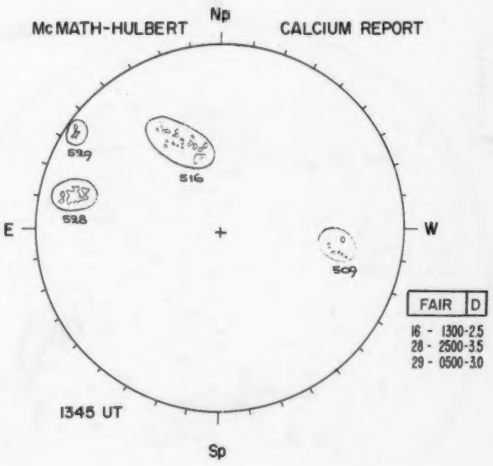


SUNSPOTS

CORONA

NORIKURA

McMATH-HULBERT

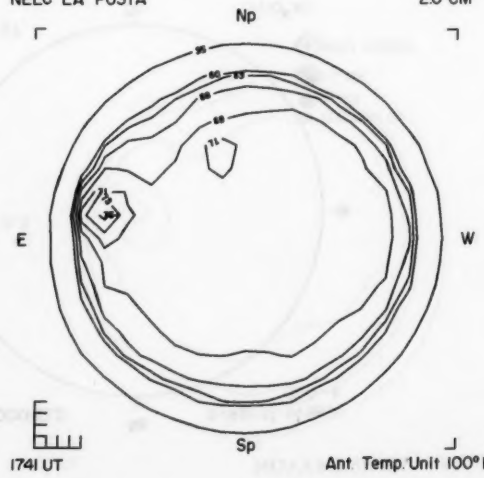


CALCIUM REPORT

FAIR D

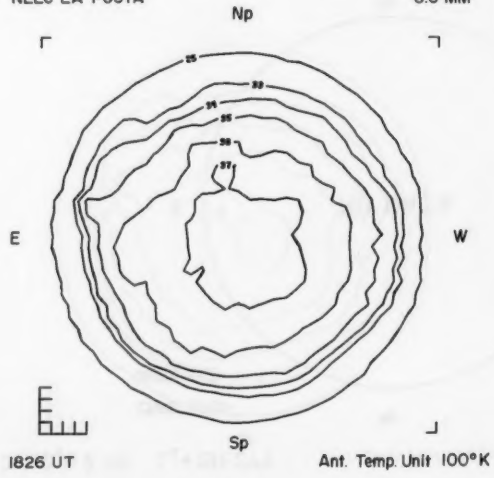
16 - 1300-2.5
28 - 2500-3.5
29 - 0500-3.0

NELC LA POSTA 2.0 CM



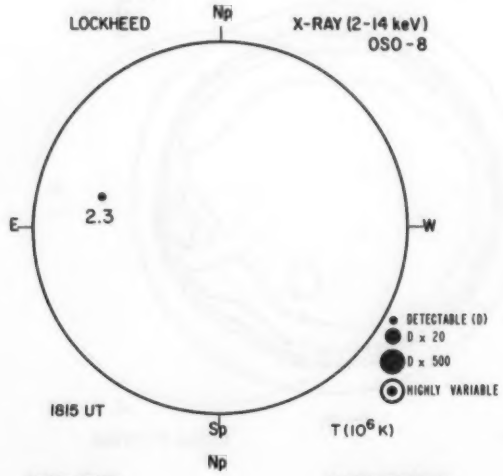
Ant. Temp. Unit 100°K

NELC LA POSTA 8.6 MM



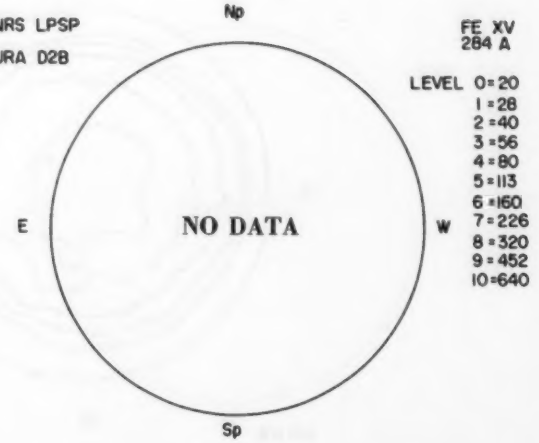
Ant. Temp. Unit 100°K

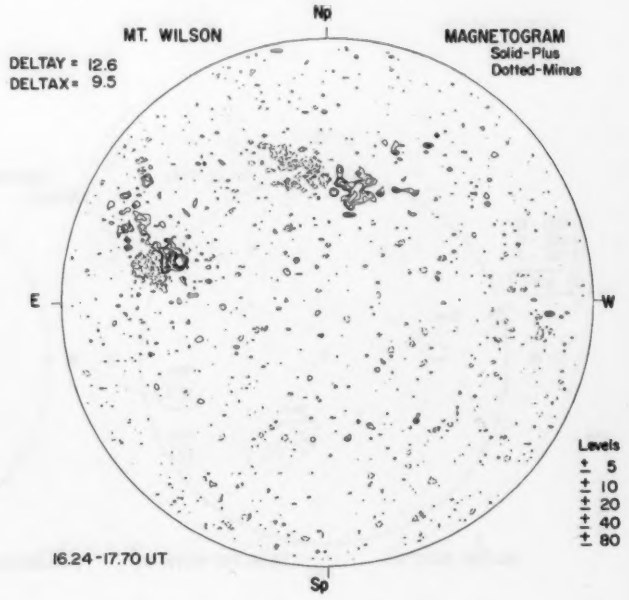
NOVEMBER 20, 1976 (P = 19.92, B_0 = 2.19, L_0 = 191.27)



KITT PEAK

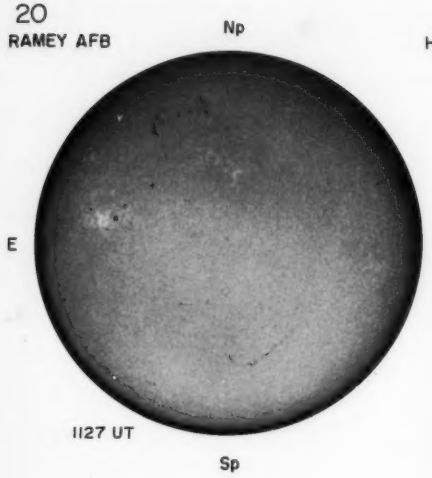
MAGNETOGRAM
Bright - Plus
Dark - Minus





20

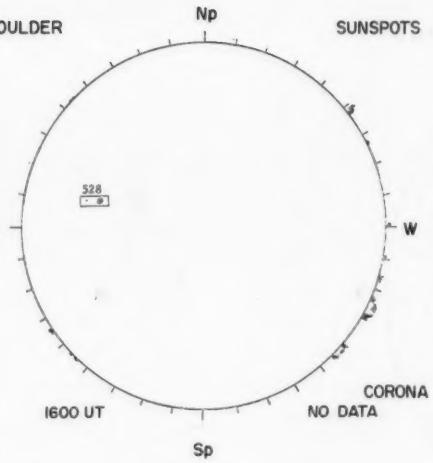
RAMEY AFB



1127 UT

Hα

BOULDER



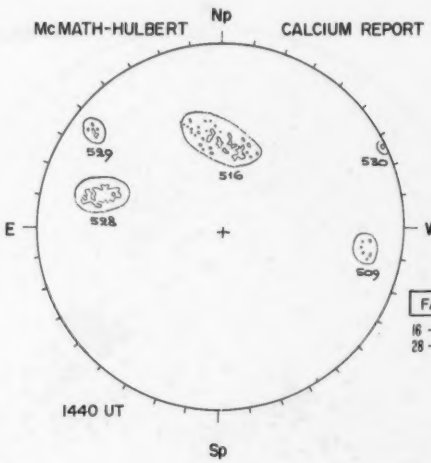
1600 UT

SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT



1440 UT

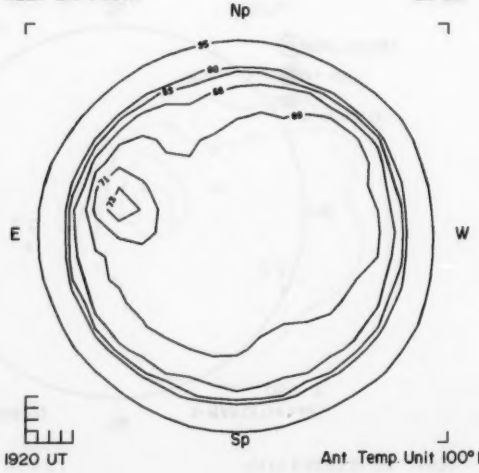
CALCIUM REPORT

FAIR	M

16 - 1300-2.5
28 - 2800-3.5

NELC LA POSTA

2.0 CM

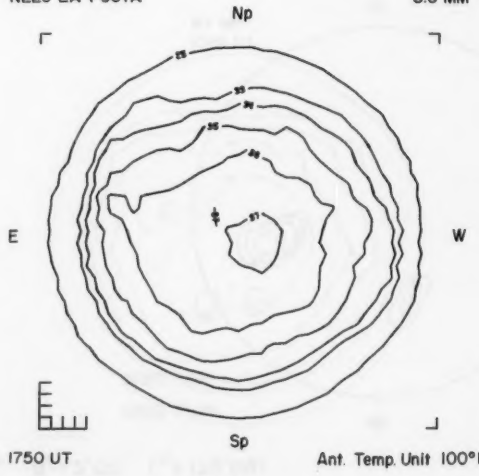


1920 UT

Ant. Temp. Unit 100°K

NELC LA POSTA

8.6 MM

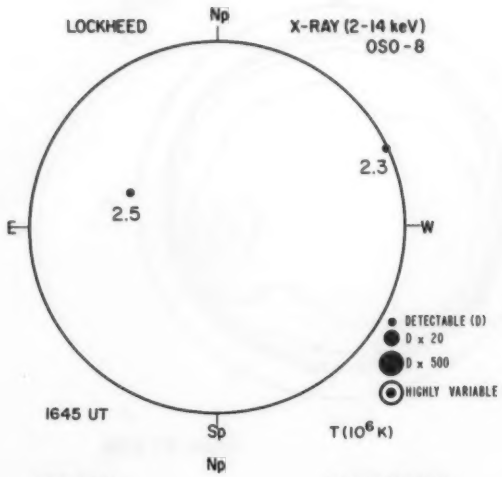


1750 UT

Ant. Temp. Unit 100°K

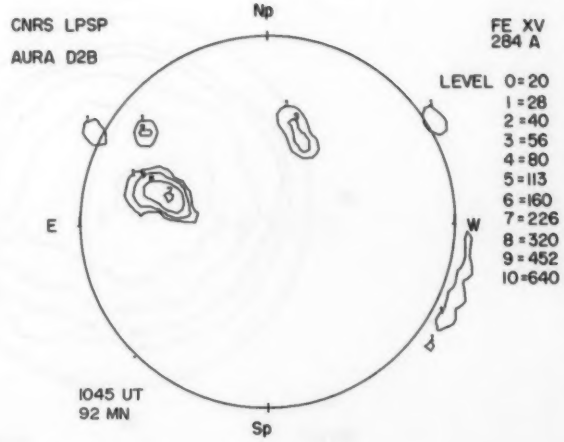
65
Nov 76

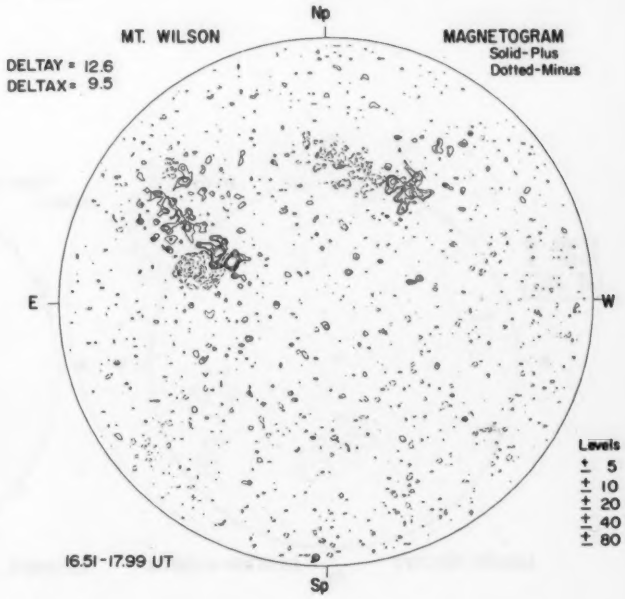
NOVEMBER 21, 1976 (P = 19.61, B_o = 2.07, L_o = 178.09)



KITT PEAK

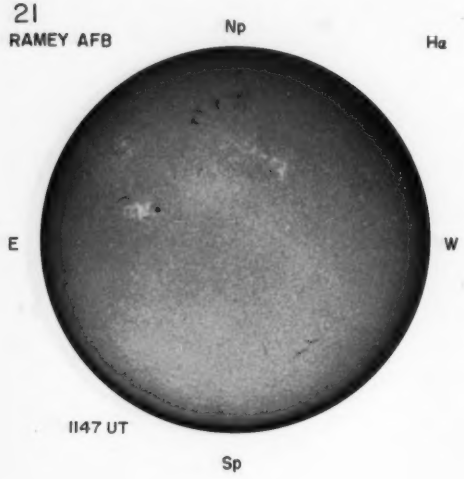
MAGNETOGRAM
Bright - Plus
Dark - Minus





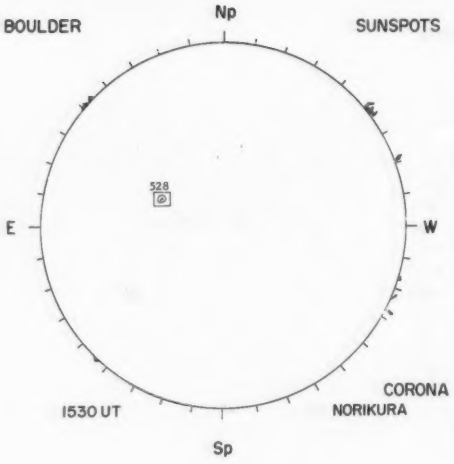
21

RAMEY AFB



1147 UT

Hα BOULDER



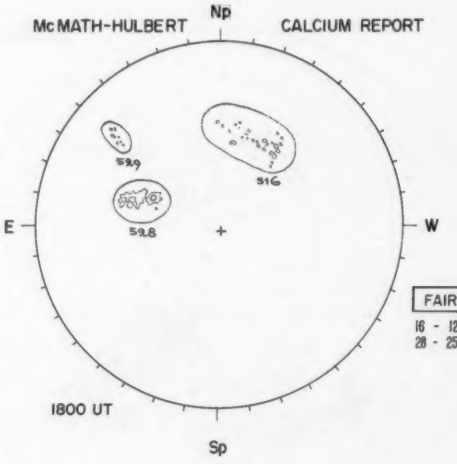
1530 UT

SUNSPOTS

CORONA

NORIKURA

McMATH-HULBERT



1800 UT

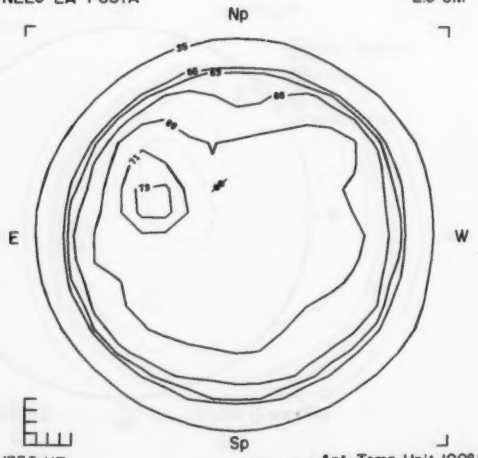
CALCIUM REPORT

FAIR D

16 - 1200-25

28 - 2500-35

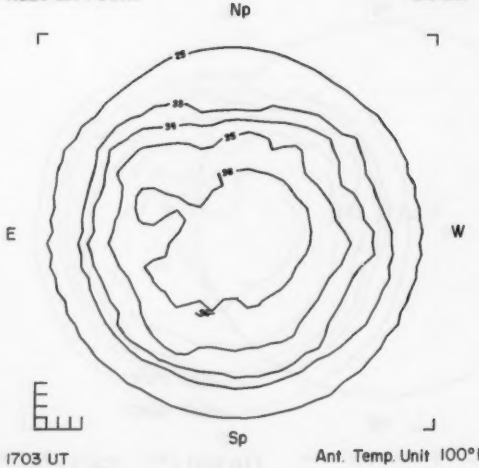
NELC LA POSTA 2.0 CM



1956 UT

Ant. Temp. Unit 100°K

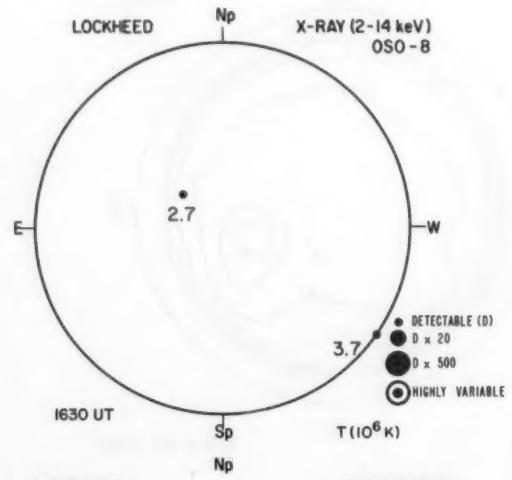
NELC LA POSTA 8.6 MM

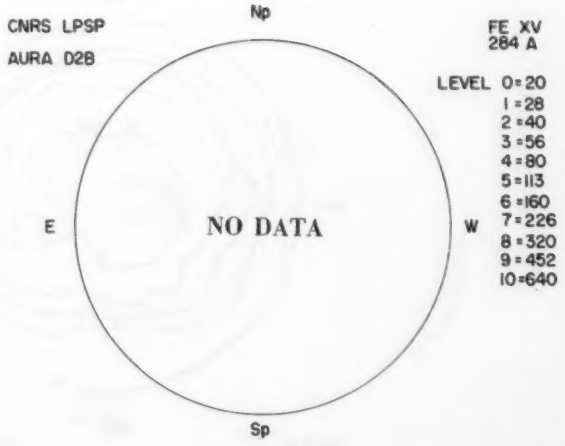


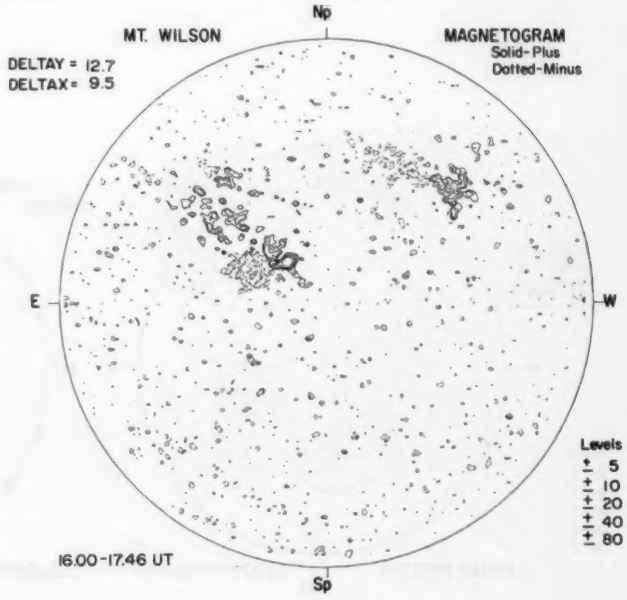
1703 UT

Ant. Temp. Unit 100°K

NOVEMBER 22, 1976 (P = 19.28, B_o = 1.95, L_o = 164.91)

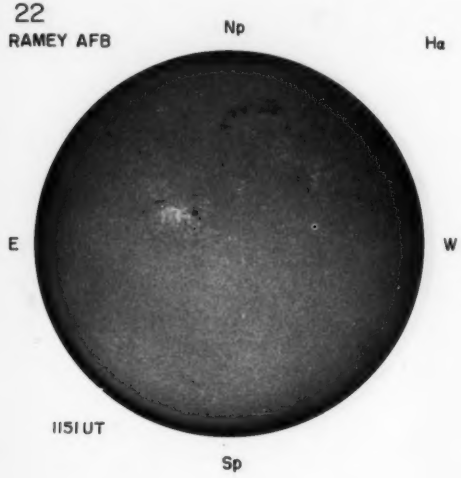






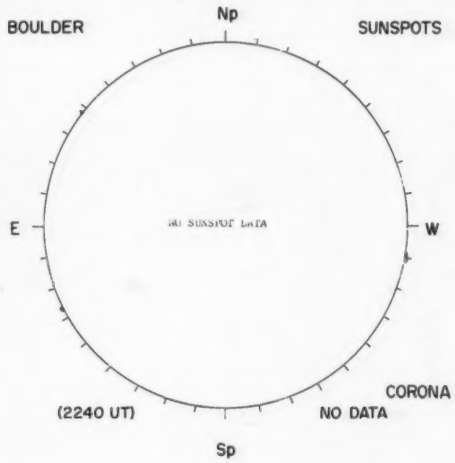
22

RAMEY AFB



1151 UT

Hα BOULDER



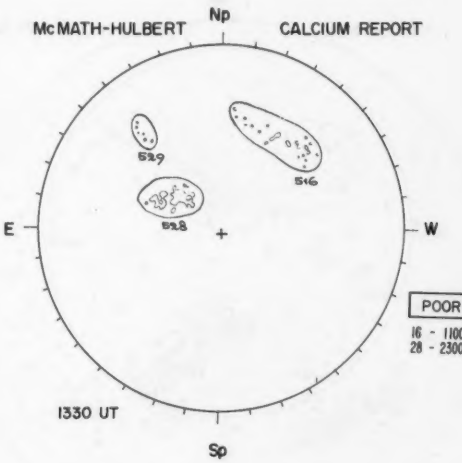
(2240 UT)

SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT



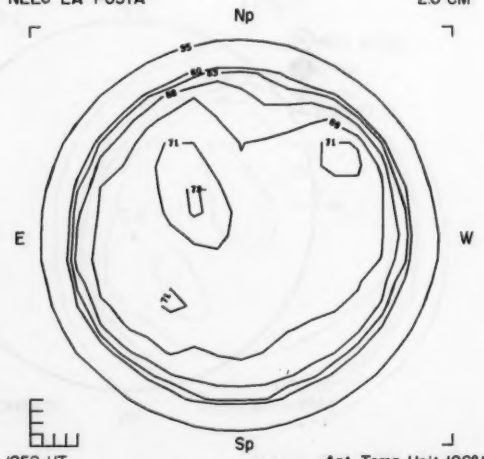
1330 UT

CALCIUM REPORT

POOR	S

16 - 1100-25
28 - 2300-35

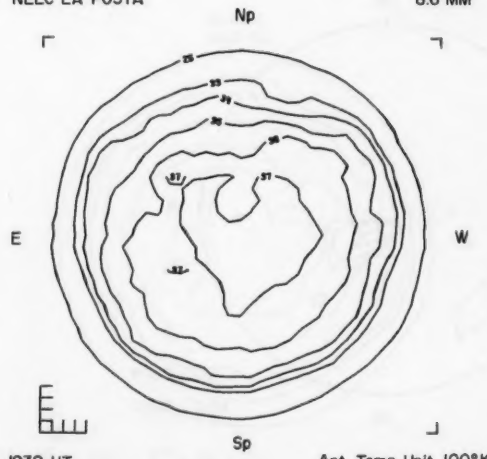
NELC LA POSTA 2.0 CM



1852 UT

Ant. Temp. Unit 100°K

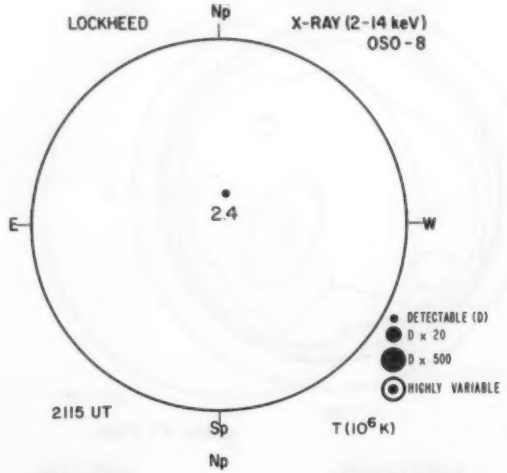
NELC LA POSTA 8.6 MM



1939 UT

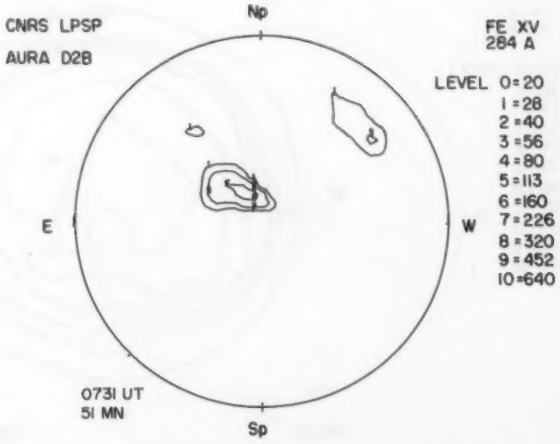
Ant. Temp. Unit 100°K

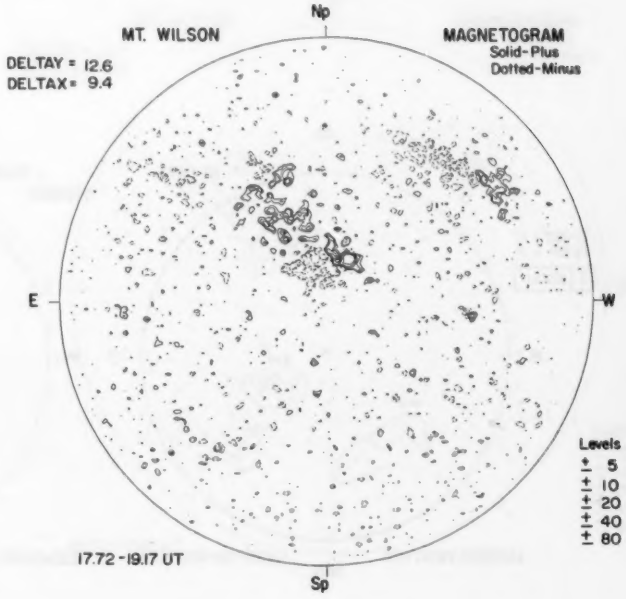
NOVEMBER 23, 1976 (P = 18.95, B_o = 1.82, L_o = 151.73)



KITT PEAK

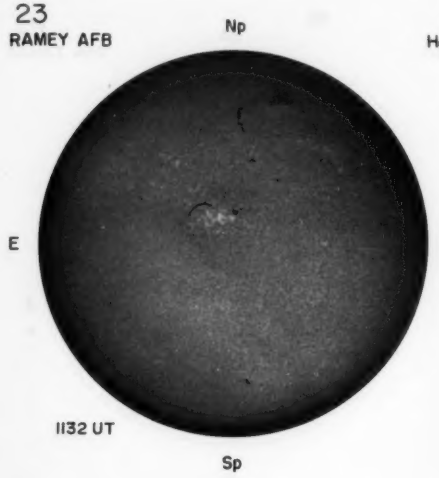
MAGNETOGRAM
Bright - Plus
Dark - Minus



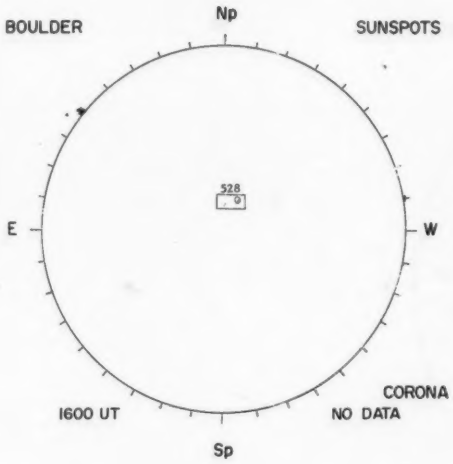


23

RAMEY AFB



Hα BOULDER



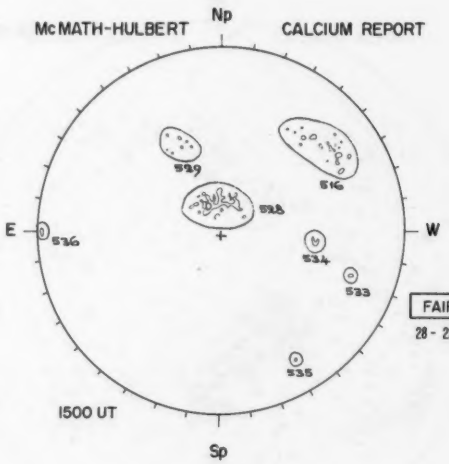
SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT

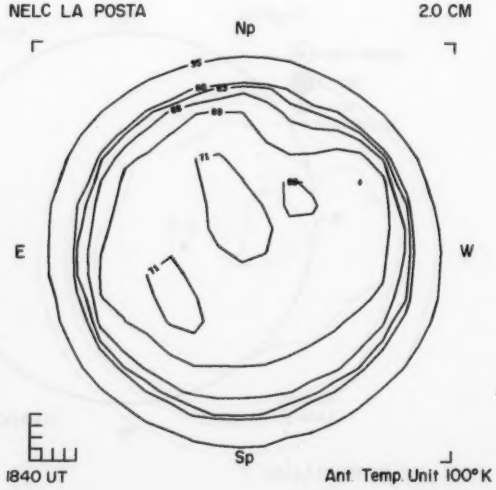
CALCIUM REPORT



FAIR D

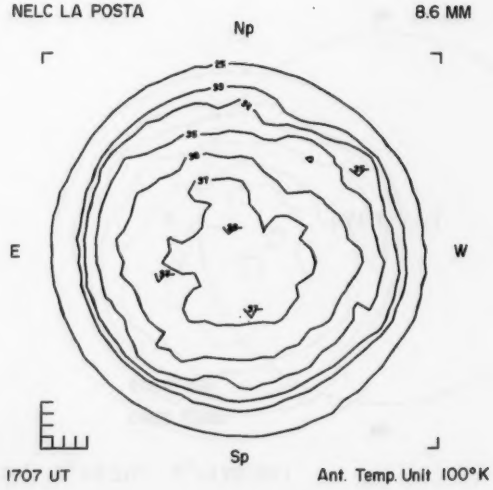
28 - 2200-3.5

NELC LA POSTA 2.0 CM



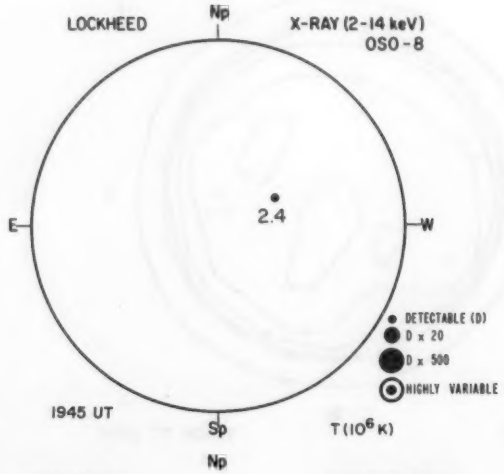
Ant. Temp. Unit 100°K

NELC LA POSTA 8.6 MM



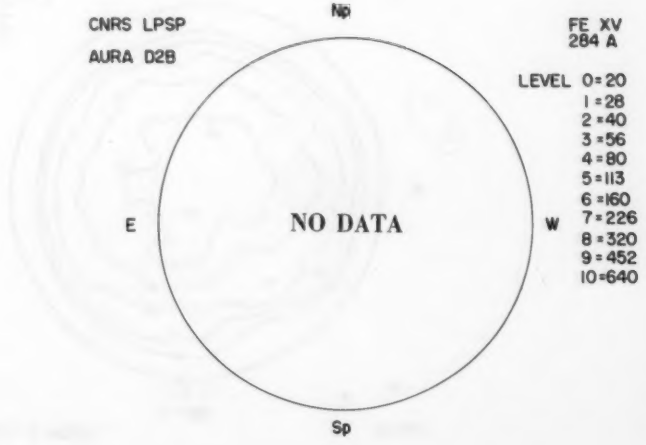
Ant. Temp. Unit 100°K

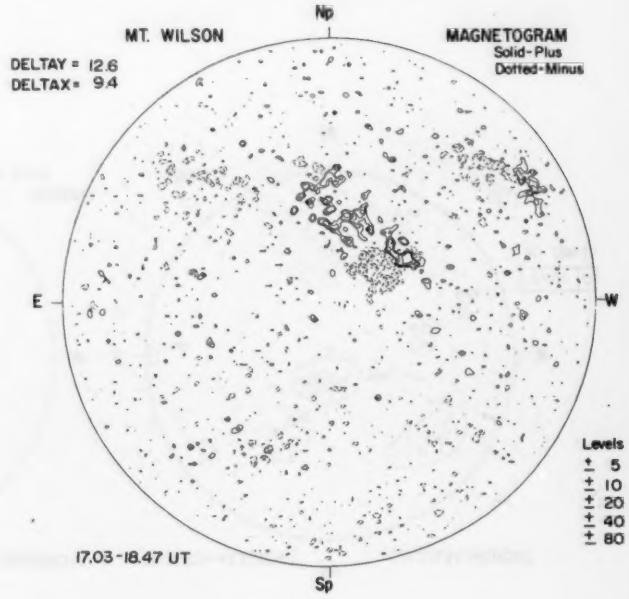
NOVEMBER 24, 1976 (P = 18.61, B_0 = 1.70, L_0 = 138.55)



KITT PEAK

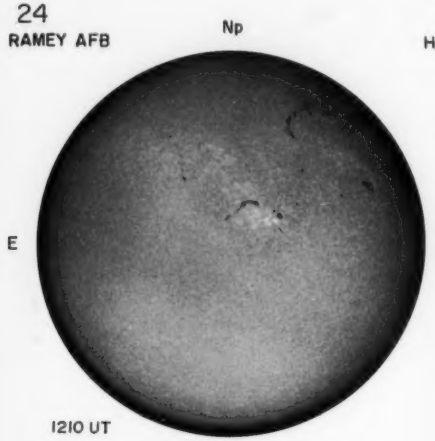
MAGNETOGRAM
Bright - Plus
Dark - Minus





24

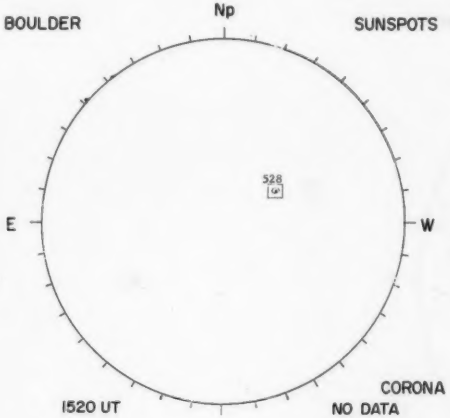
RAMEY AFB



Hα

1210 UT

BOULDER



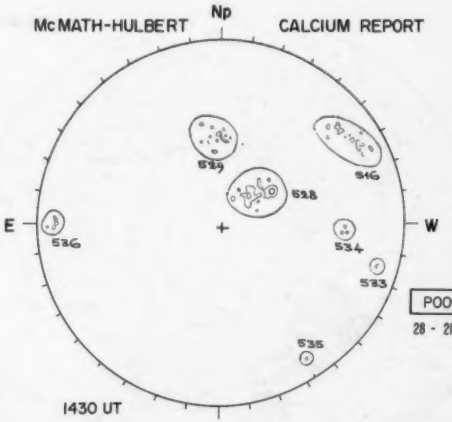
SUNSPOTS

1520 UT

CORONA

NO DATA

McMATH-HULBERT



CALCIUM REPORT

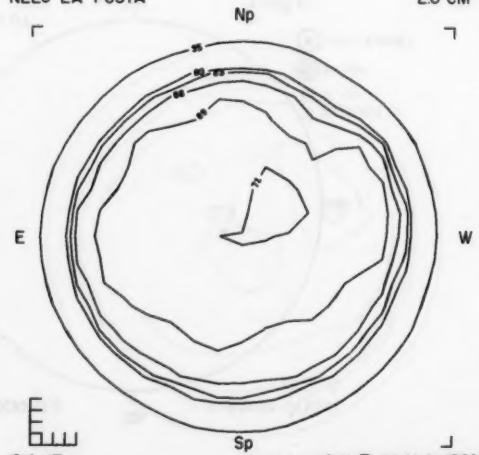
POOR | S

28 - 2100-35

1430 UT

NELC LA POSTA

2.0 CM

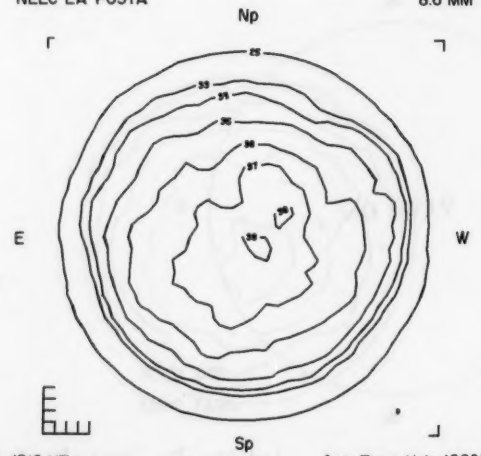


1814 UT

Ant. Temp. Unit 100°K

NELC LA POSTA

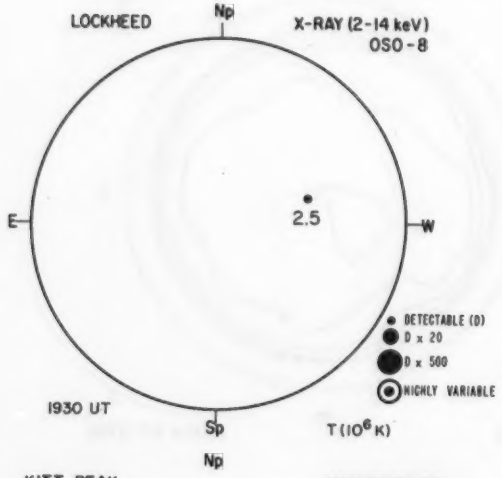
8.6 MM

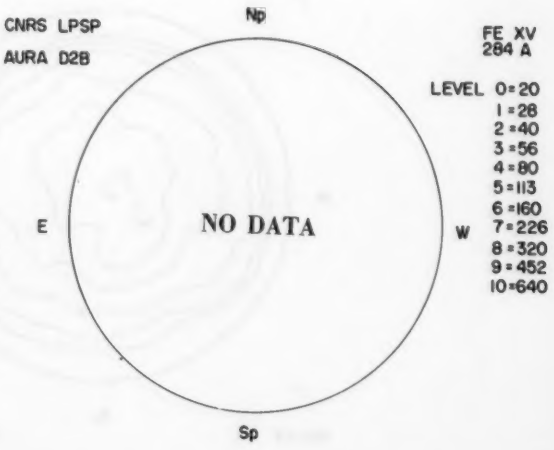


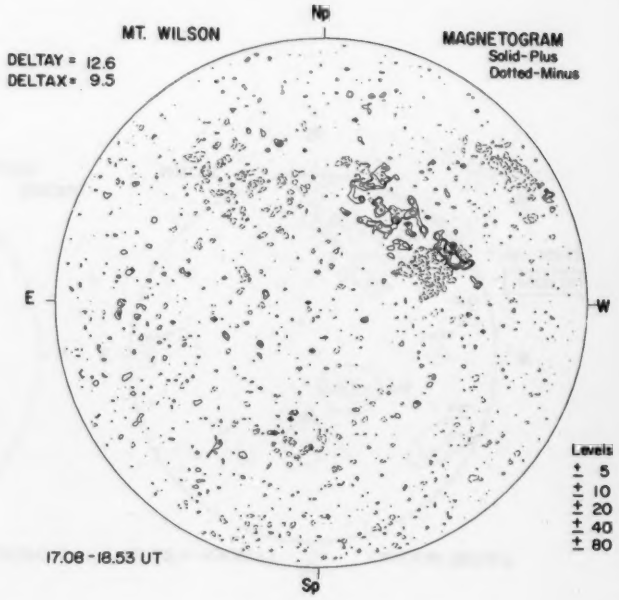
1916 UT

Ant. Temp. Unit 100°K

NOVEMBER 25, 1976 (P = 18.27, B_0 = 1.58, L_0 = 125.37)

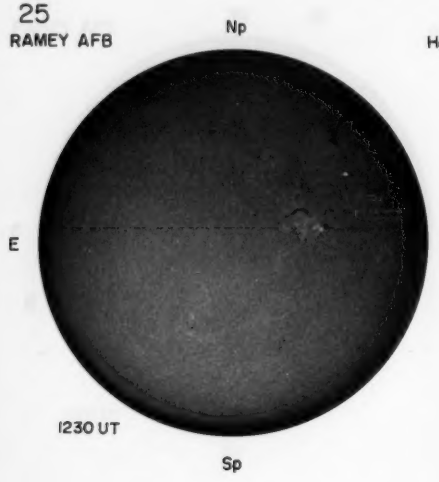






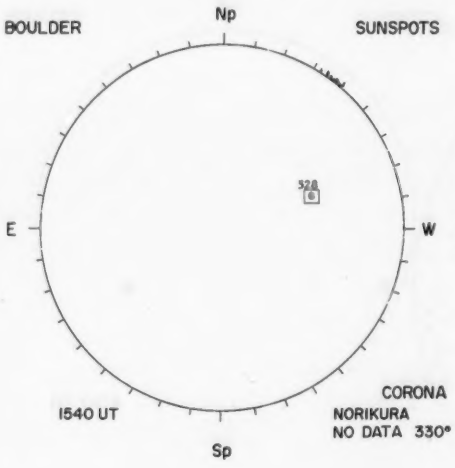
25

RAMEY AFB



1230 UT

Hα BOULDER



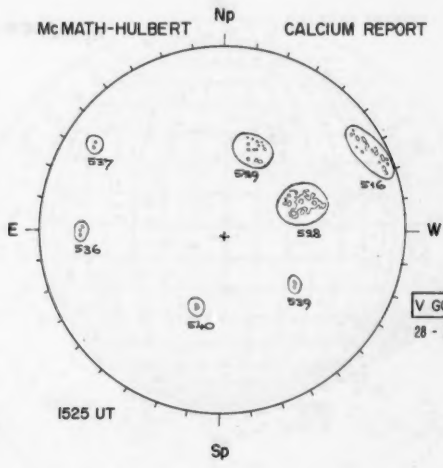
1540 UT

SUNSPOTS

CORONA
NORIKURA
NO DATA 330°

McMATH-HULBERT

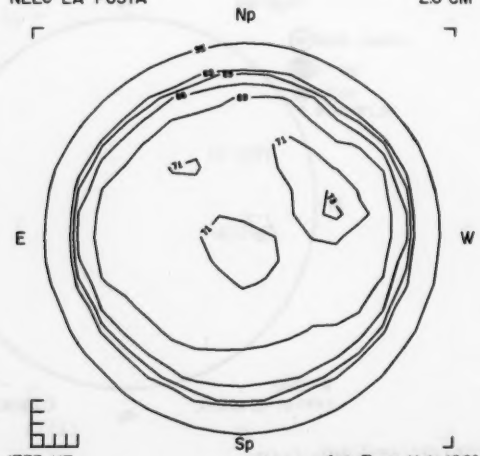
CALCIUM REPORT



1525 UT

V GOOD M
28 - 2200-30

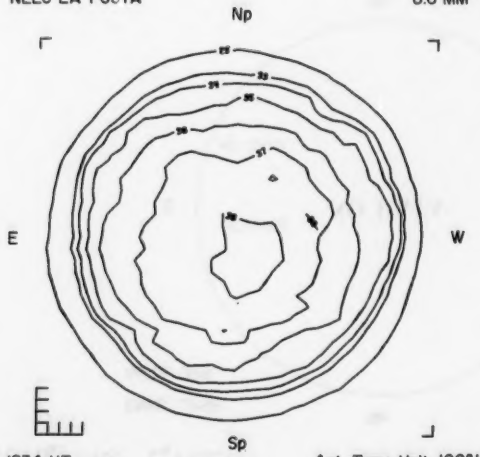
NELC LA POSTA 2.0 CM



1733 UT

Ant. Temp. Unit 100°K

NELC LA POSTA 8.6 MM

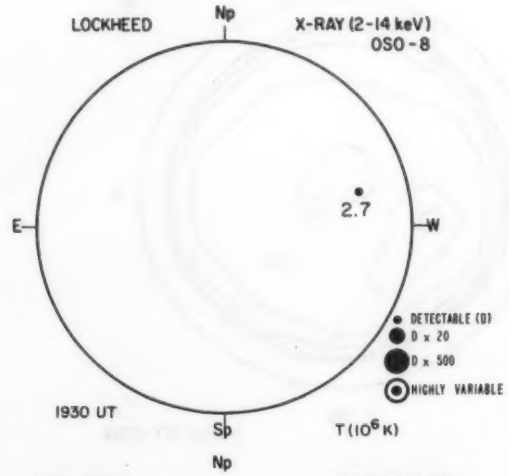


1834 UT

Ant. Temp. Unit 100°K

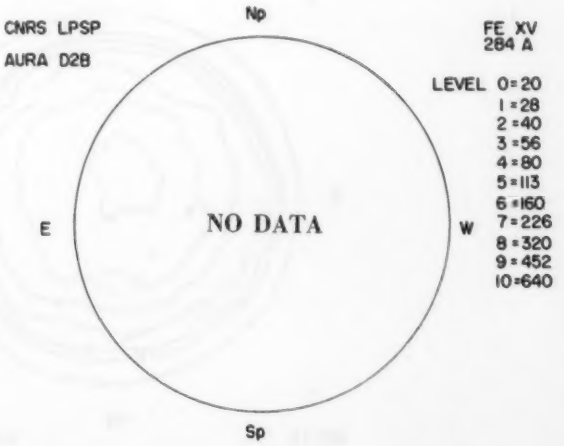
75
Nov 76

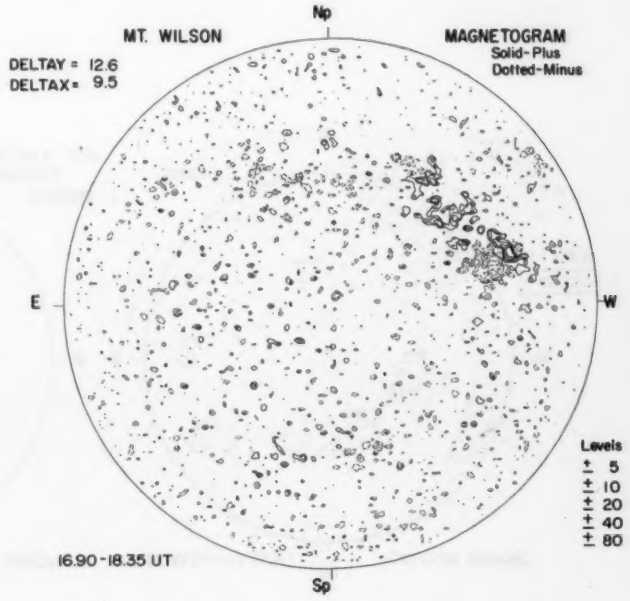
NOVEMBER 26, 1976 (P = 17.92, B_o = 1.45, L_o = 112.19)



KITT PEAK

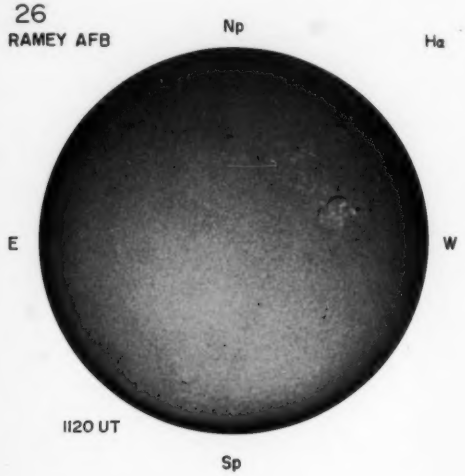
MAGNETOGRAM
Bright - Plus
Dark - Minus



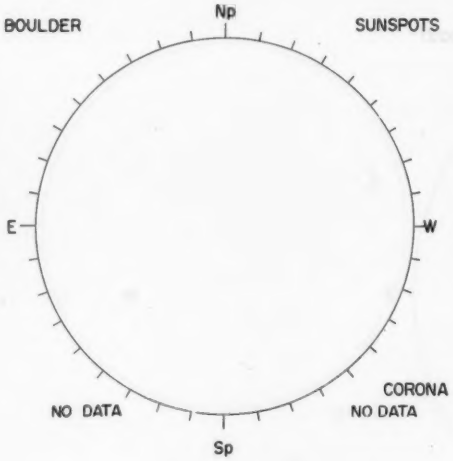


26

RAMEY AFB



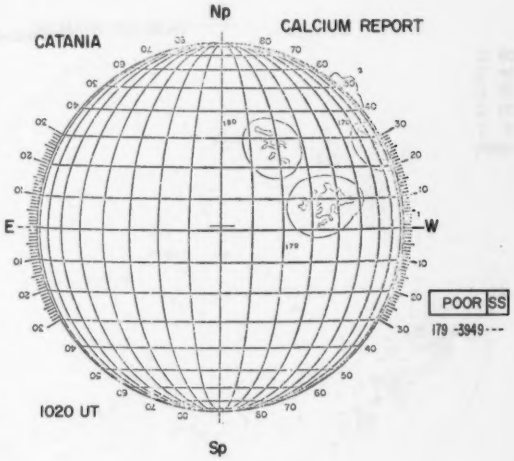
Hα BOULDER



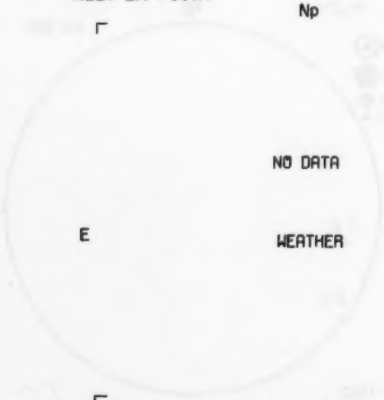
SUNSPOTS

CATANIA

CALCIUM REPORT



NELC LA POSTA



2.0 CM

Ant. Temp. Unit 100°K

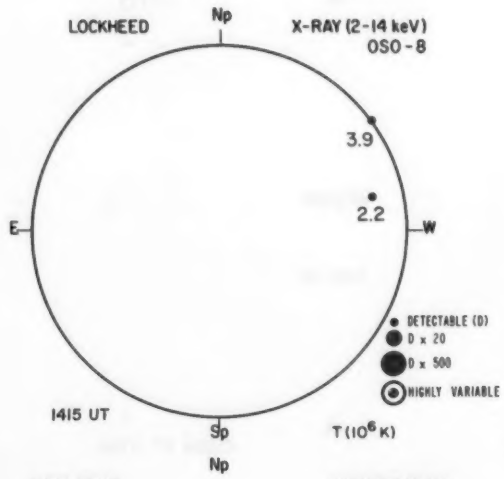
NELC LA POSTA

8.6 MM

Ant. Temp. Unit 100°K

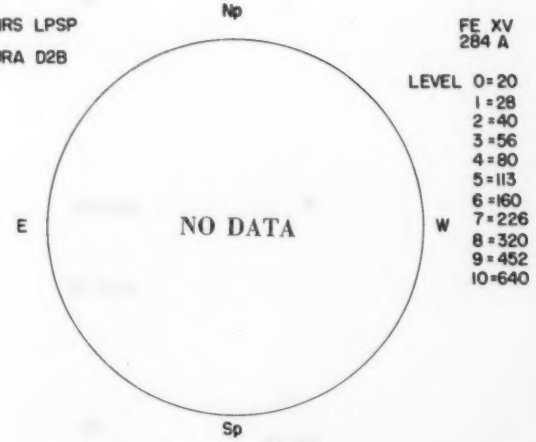
77
Nov 76

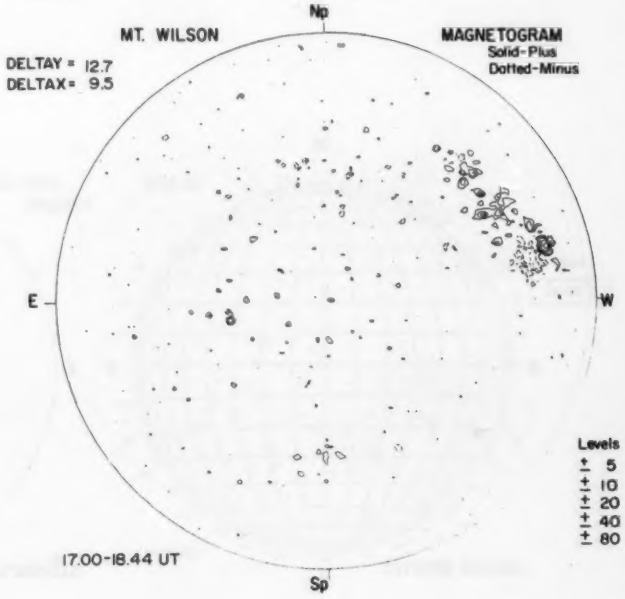
NOVEMBER 27, 1976 (P = 17.56, B_o = 1.33, L_o = 99.01)



KITT PEAK

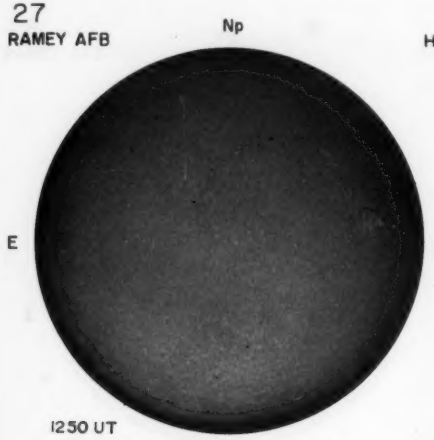
MAGNETOGRAM
Bright - Plus
Dark - Minus





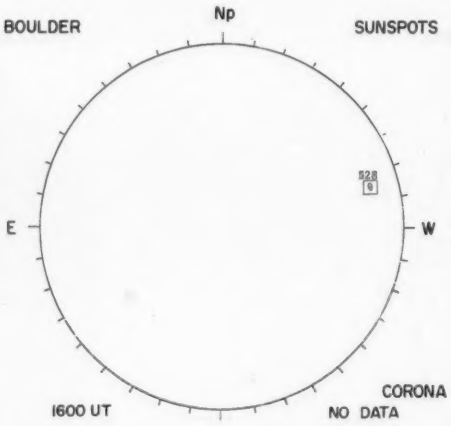
27

RAMEY AFB



1250 UT

Hα BOULDER



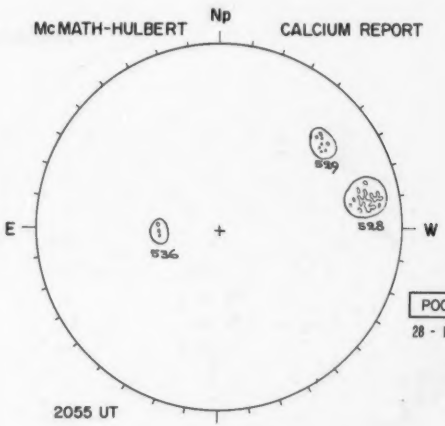
1600 UT

SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT



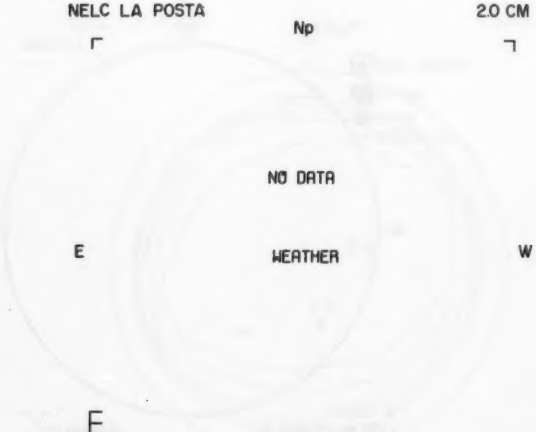
2055 UT

CALCIUM REPORT

POOR | M

28 - 1800-25

NELC LA POSTA



---- UT

2.0 CM

Ant. Temp. Unit 100°K

NELC LA POSTA

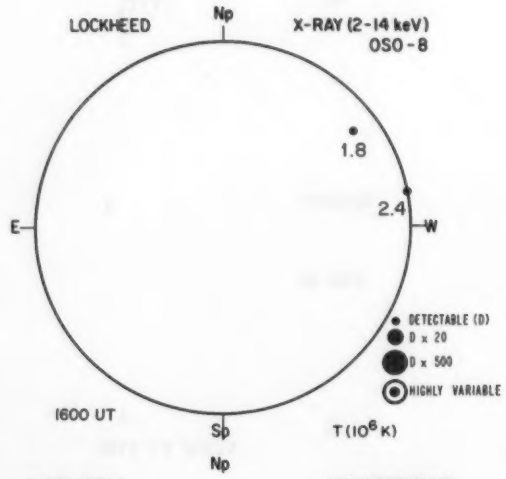
---- UT

8.6 MM

Ant. Temp. Unit 100°K

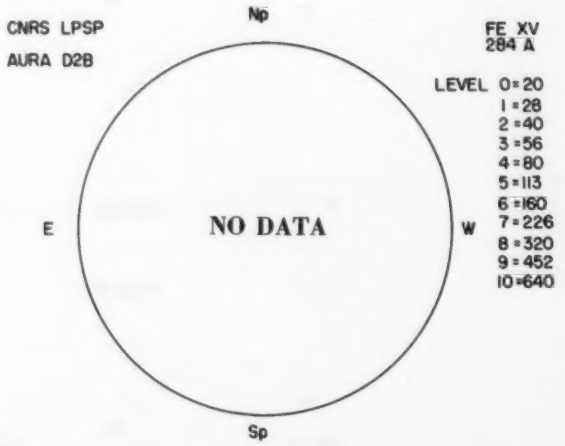
79
Nov 76

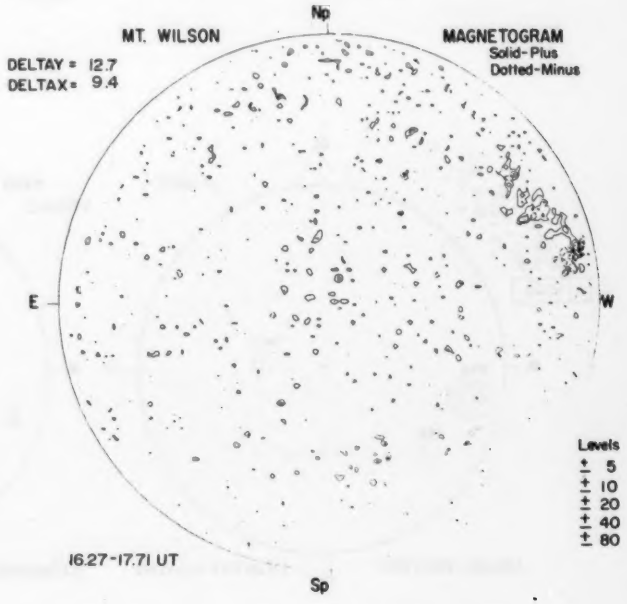
NOVEMBER 28, 1976 (P = 17.19, B_o = 1.20, L_o = 85.83)



KITT PEAK

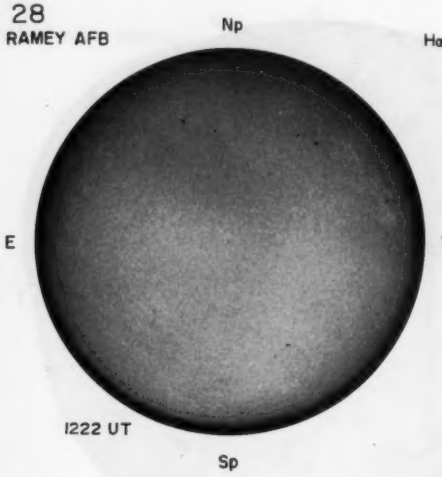
MAGNETOGRAM
Bright - Plus
Dark - Minus





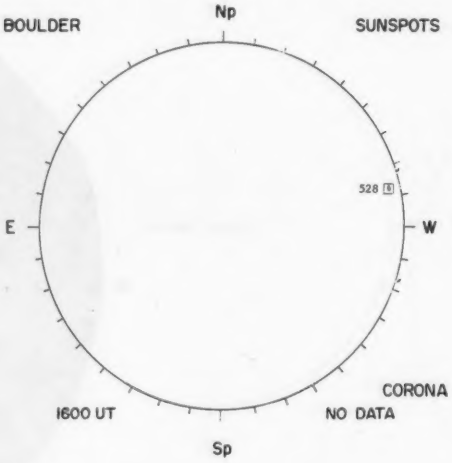
28

RAMEY AFB



1222 UT

Hα BOULDER



1600 UT

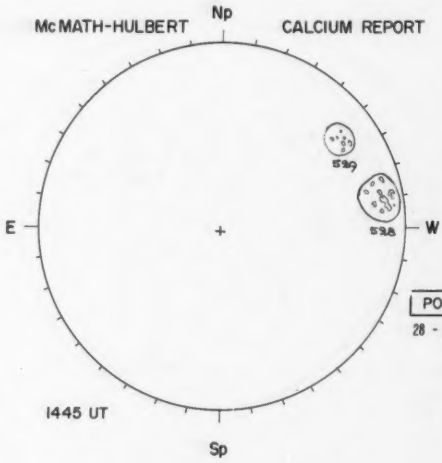
SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT

CALCIUM REPORT



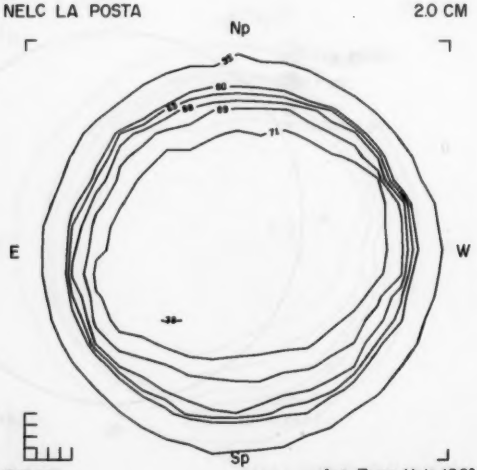
1445 UT

POOR D

28 - 1600-2.5

NELC LA POSTA

2.0 CM



1817 UT

Ant. Temp. Unit 100°K

NELC LA POSTA

8.6 MM

NO DATA

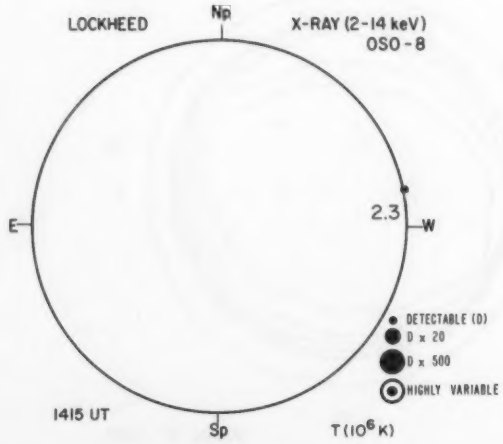
WEATHER

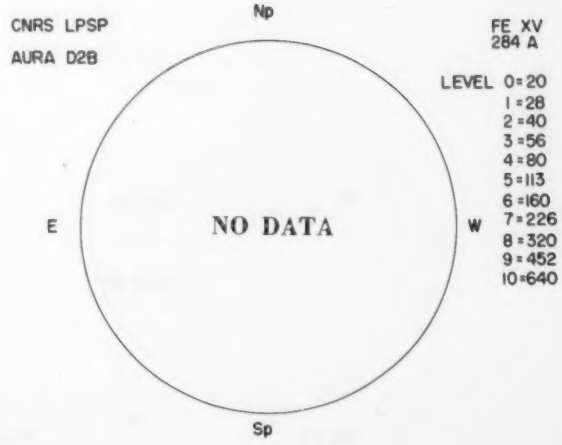
---- UT

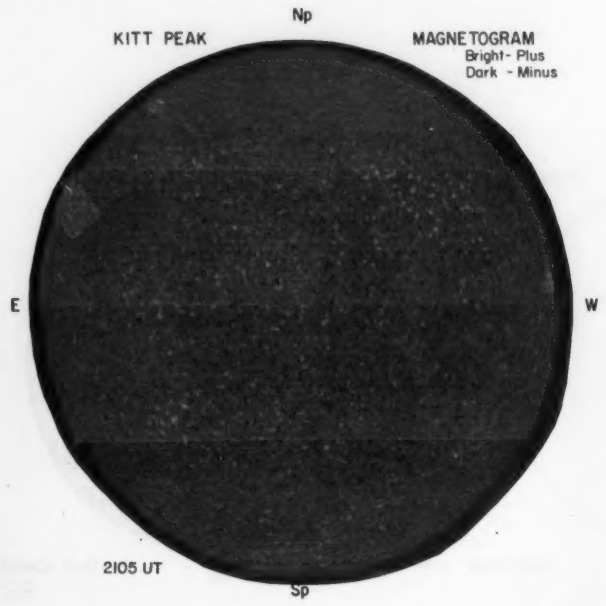
Ant. Temp. Unit 100°K

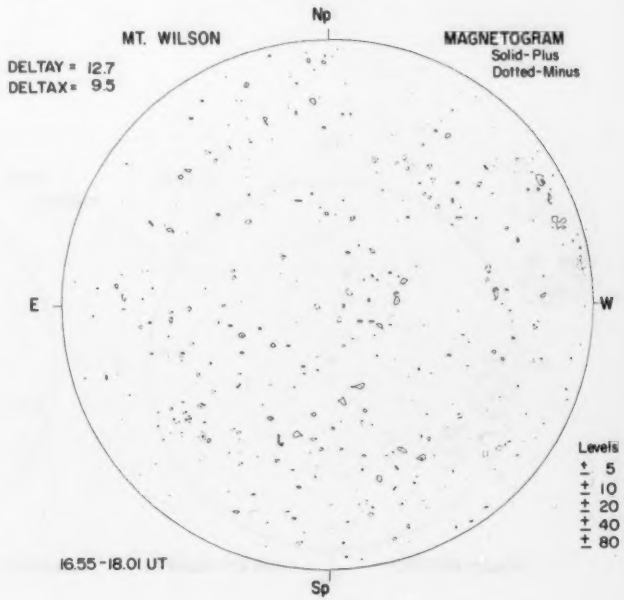
81
Nov 76

NOVEMBER 29, 1976 (P = 16.82, B_o = 1.07, L_o = 72.65)



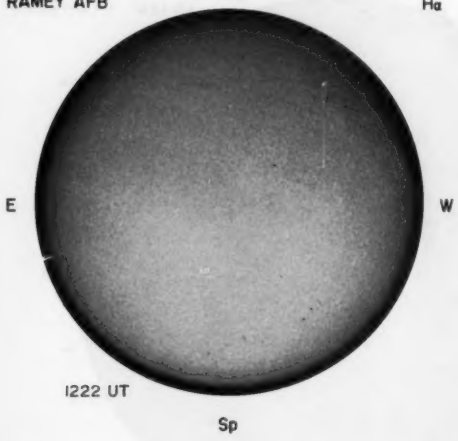






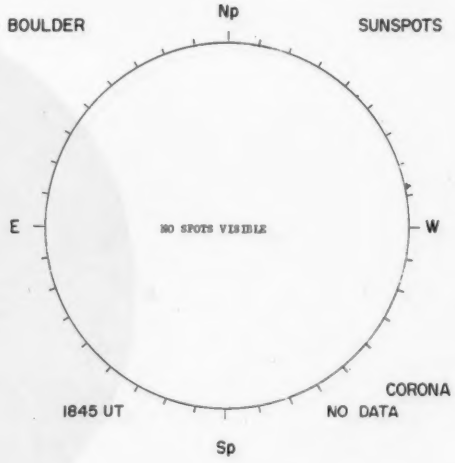
29

RAMEY AFB



1222 UT

Hα BOULDER



1845 UT

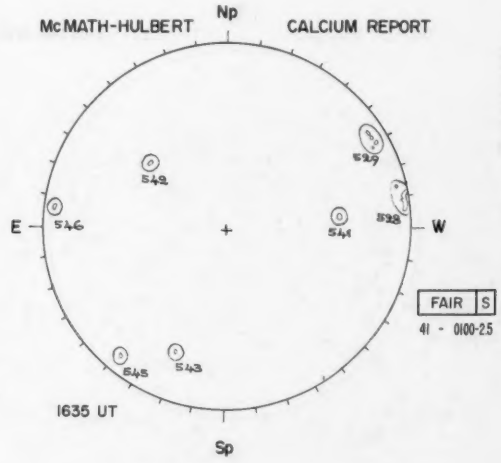
SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT

CALCIUM REPORT

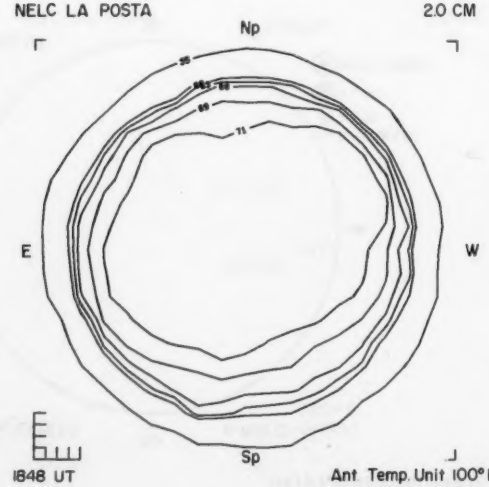


1635 UT

FAIR | S

41 - 0100-25

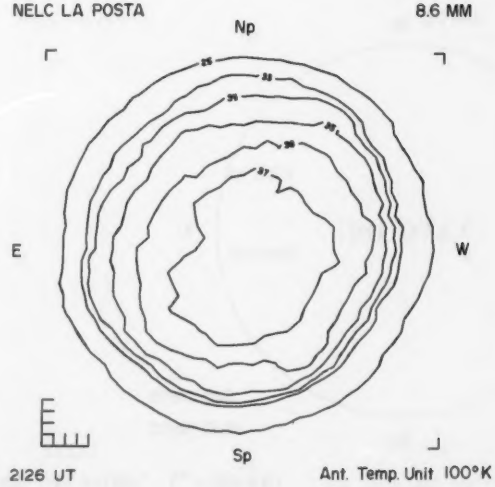
NELC LA POSTA 2.0 CM



1848 UT

Ant. Temp. Unit 100°K

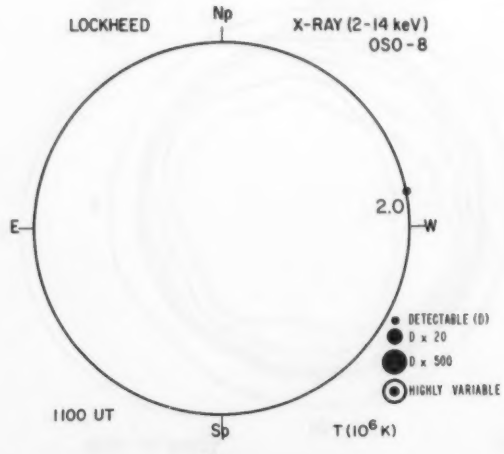
NELC LA POSTA 8.6 MM

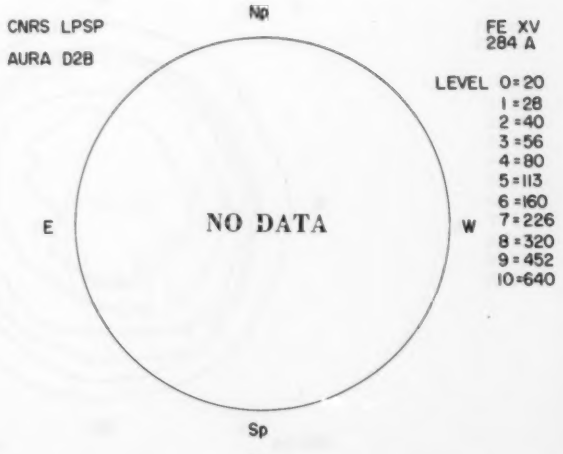


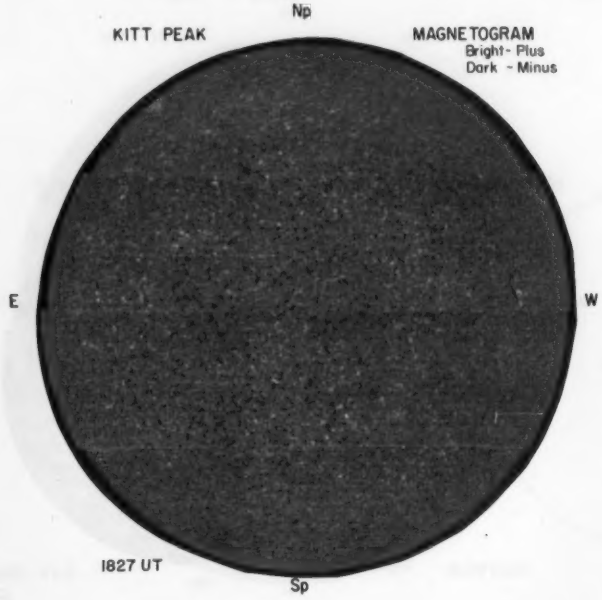
2126 UT

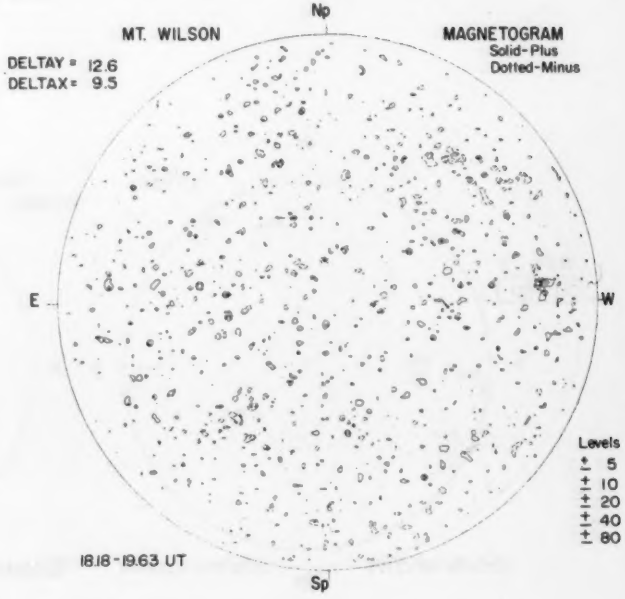
Ant. Temp. Unit 100°K

NOVEMBER 30, 1976 (P = 16.45, B_o = 0.95, L_o = 59.48)



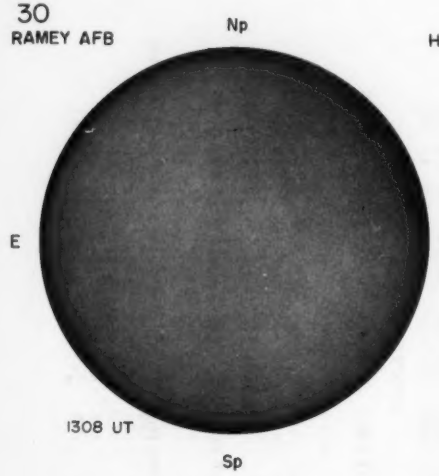




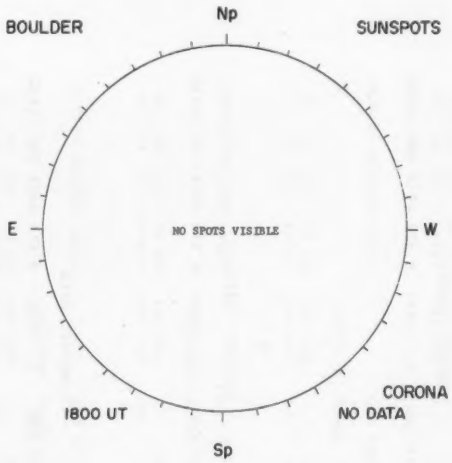


30

RAMEY AFB



Hα BOULDER



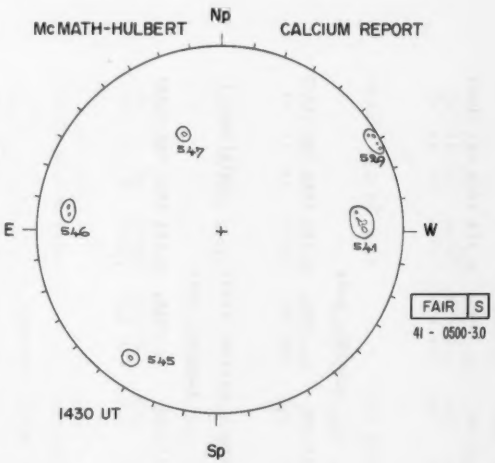
SUNSPOTS

CORONA

NO DATA

McMATH-HULBERT

CALCIUM REPORT



FAIR | S

41 - 0500-30

NELC LA POSTA

Np

2.0 CM

---- UT

Ant. Temp. Unit 100°K

NELC LA POSTA

Np

8.6 MM

---- UT

Ant. Temp. Unit 100°K

85
Nov 76

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1976

MCMATH REGION 14505 CMP DATE 1.8

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
76	11	1	14505	N26 E03	71	200	1.0									
76	11	2	14505	N26 W16	69	100	1.5									

MCMATH REGION 14507 CMP DATE 4.7

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
76	11	4	14507	N29 E00	33	100	1.0									

MCMATH REGION 14504 CMP DATE 5.0 RETURN OF REGION 14463* ROTATION 3

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
76	10	31	14504	S21 E57	28	200	1.0									
76	11	1	14504	S21 E45	29	100	1.0									
76	11	2	14504	S24 E30	29	200	1.5									
76	11	3	14504	S21 E19	28	200	1.0									
76	11	4	14504	S21 E04	29	100	1.0									

MCMATH REGION 14502 CMP DATE 5.1

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
76	10	31	14502	S03 E60	25	300	2.0									
76	11	1	14502	S03 E50	24	300	1.5									
76	11	2	14502	S03 E37	22	200	1.5									
76	11	3	14502	S03 E22	25	200	1.0									
76	11	4	14502	S03 E06	27	100	1.0									

MCMATH REGION 14503 CMP DATE 5.3

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
76	11	1	14503	N35 E49	25	100	1.0									
76	11	2	14503	N35 E36	23	100	1.5									

MCMATH REGION 14514 CMP DATE 9.3

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
76	11	12	14514	S05 W44	333	100	1.5									

MCMATH REGION 14513 CMP DATE 10.1

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
76	11	12	14513	N16 W33	322	300	2.5									

MCMATH REGION 14515 CMP DATE 10.5

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA					
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
76	11	12	14515	S10 W28	317	100	1.5									

* An asterisk beside the "Return of Region" number indicates that the new region is only part of the area of the old region.

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1976

MCMATH REGION 14517 CMP DATE 10.8

			CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
76	11	15	14517	N23 W64	313	300	3.0								
76	11	16	14517	N23 W77	312	300	2.5								

MCMATH REGION 14511 CMP DATE 11.2

			CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
76	11	11	14511	S32 W05	306	100	1.0								

MCMATH REGION 14510 CMP DATE 11.4

			CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
76	11	11	14510	N18 W03	306	100	1.5								
76	11	12	14510	N18 W17	306	200	2.5								

MCMATH REGION 14519 CMP DATE 11.5

			CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
76	11	15	14519	N70 W55	304	200	1.0								

MCMATH REGION 14520 CMP DATE 11.7

			CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
76	11	15	14520	S16 W52	301	100	1.0								

MCMATH REGION 14525 CMP DATE 11.8

			CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
76	11	15	14525	N37 W51	300	100	1.5								

MCMATH REGION 14518 CMP DATE 12.0

			CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
76	11	15	14518	N23 W48	297	200	2.0								
76	11	16	14518	N23 W61	296	200	3.0								
76	11	17	14518	N23 W75	297	300	2.5								
76	11	18	14518	N23 W88	298	600	3.0								

MCMATH REGION 14506 CMP DATE 13.1 RETURN OF REGION 14475 ROTATION 2

			CALCIUM	PLAGE	DATA			SUNSPOT	DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT CLASS
76	11	6	14506	S28 E90	278	500	1.0								
76	11	7	14506	S31 E70	285	600	1.5								
76	11	8	14506	S30 E57	285	700	1.0								
76	11	9	14506	S30 E45	283	500	1.0								
76	11	10	14506	S30 E33	283	500	1.0								
76	11	11	14506	S29 E20	283	500	1.0								
76	11	12	14506	S29 E07	282	500	1.0								
76	11	13	14506	S29 W06	281	500	1.0								
76	11	14	14506	S29 W18	281	500	1.0								
76	11	15	14506	S29 W29	278	500	1.0								
76	11	16	14506	S29 W40	275	300	1.0								
76	11	17	14506	S29 W53	275	300	1.0								
76	11	18	14506	S29 W65	275	300	1.0								

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1976

MCMATH REGION 14508 CMP DATE 13.5

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	10	14508	S05 E39	277	100	1.5								

MCMATH REGION 14530 CMP DATE 14.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	20	14530	N27 W55	268	200	2.0								

MCMATH REGION 14512 CMP DATE 14.5

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	11	14512	S10 E39	264	100	1.0								

MCMATH REGION 14509 CMP DATE 16.6 RETURN OF REGION 14500 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	10	14509	S05 E85	231	800	1.5								
76	11	11	14509	S04 E67	236	900	1.5								
76	11	12	14509	S04 E54	235	800	2.0								
76	11	13	14509	S04 E39	236	800	2.0								
76	11	14	14509	S05 E26	237	600	2.0								
76	11	15	14509	S04 E12	237	500	2.0								
76	11	16	14509	S04 W02	237	300	1.5								
76	11	17	14509	S04 W15	237	400	2.0								
76	11	18	14509	S05 W28	238	300	1.0								
76	11	19	14509	S05 W40	237	300	1.0								
76	11	20	14509	S05 W53	236	300	1.0								

MCMATH REGION 14523 CMP DATE 16.7

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	15	14523	N37 E14	235	200	1.0								

MCMATH REGION 14526B CMP DATE 18.9

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	16	14526B	N21 E28	207	100	1.0								

MCMATH REGION 14526A CMP DATE 19.4

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	16	14526A	N43 E34	201	100	1.0								
76	11	17	14526A	N43 E21	201	100	1.0								

MCMATH REGION 14524 CMP DATE 19.7

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	15	14524	N06 E54	195	100	1.0								

MCMATH REGION 14533 CMP DATE 20.1

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	23	14533	S12 W47	190	100	1.5								
76	11	24	14533	S12 W61	192	100	1.0								

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1976

MCMATH REGION 14527 CMP DATE 20.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	16	14527	S05 E45	190	100	1.0								

MCMATH REGION 14516 CMP DATE 20.8 RETURN OF REGION 14494 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	13	14516	N27 E85	190	600	2.0								
76	11	14	14516	N30 E77	186	1600	2.5								
76	11	15	14516	N30 E66	183	1600	2.5								
76	11	16	14516	N30 E54	181	1300	2.5								
76	11	17	14516	N30 E40	182	1400	3.0								
76	11	18	14516	N30 E27	183	1200	2.5								
76	11	19	14516	N30 E15	182	1300	2.5								
76	11	20	14516	N30 E02	181	1300	2.5								
76	11	21	14516	N30 W11	180	1200	2.5								
76	11	22	14516	N30 W24	181	1100	2.5								
76	11	23	14516	N30 W40	183	1200	2.0								
76	11	24	14516	N30 W55	186	1200	2.0								
76	11	25	14516	N29 W68	185	1200	1.5								

MCMATH REGION 14535 CMP DATE 21.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	23	14535	S43 W34	177	100	1.0								
76	11	24	14535	S45 W45	176	100	1.0								

MCMATH REGION 14534 CMP DATE 21.3

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	23	14534	S02 W31	174	200	2.0								
76	11	24	14534	S02 W44	175	200	1.0								

MCMATH REGION 14528 CMP DATE 23.7

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	17	14528	N12 E83	139	1600	3.0	19733	N11 E76	146	(AF)	4 B	110	1	HSX
76	11	18	14528	N13 E68	142	2800	4.0	19733	N11 E65	142	(BF)	5 B	140	8	CHO
76	11	19	14528	N13 E55	142	2500	3.5	19733	N11 E51	145	(BF)	5 B	110	3	CSO
76	11	20	14528	N13 E42	141	2600	3.5	19733	N11 E38	145	(BP)	5 B	140	2	CSO
76	11	21	14528	N12 E26	143	2500	3.5	19733	N11 E23	147	(AP)	5 B	180	1	HSX
76	11	22	14528	N12 E14	143	2300	3.5	19733	N11 E11	145	(BP)	5 R	160	8	CSI
76	11	23	14528	N12 E01	142	2200	3.5	19733	N10 W03	146	(BF)	6 B	140	3	CSO
76	11	24	14528	N12 W12	143	2100	3.5	19733	N12 W17	147	(AP)	6 B	140	1	HSX
76	11	25	14528	N12 W26	143	2200	3.0	19733	N12 W31	148	(AP)	6 B	130	1	HSX
76	11	26						19733	N12 W43	147	(AP)	6 R	120	2	HSX
76	11	27	14528	N12 W55	142	1800	2.5		N11 W55			B	120	1	HSX
76	11	28	14528	N12 W64	141	1600	2.5	19733	N11 W70	147	(AP)	4 B	60	1	HSX
76	11	29	14528	N12 W80	143	1600	2.0	19733	N11 W85	149	AP	3 R	100	1	HSX

MCMATH REGION 14539 CMP DATE 23.8

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	25	14539	S15 W24	141	100	1.0								

MCMATH REGION 14529 CMP DATE 24.7

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
76	11	18	14529	N32 E80	130	600	2.5								
76	11	19	14529	N32 E68	129	500	3.0								

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1976

MCMATH REGION 14529 (CONT) CMP DATE 24.7

			CALCIUM PLAGE DATA					SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT CLASS
76	11	20	14529	N33 E55	128	300	2.0							
76	11	21	14529	N32 E41	128	400	2.0							
76	11	22	14529	N31 E30	127	300	1.5							
76	11	23	14529	N32 E16	127	300	1.5							
76	11	24	14529	N30 E01	130	500	1.5							
76	11	25	14529	N28 W11	128	400	1.5							
76	11	27	14529	N28 W40	127	400	1.5							
76	11	28	14529	N26 W49	126	400	1.5							
76	11	29	14529	N28 W66	129	400	1.5							
76	11	30	14529	N29 W78	130	400	1.0							

MCMATH REGION 14540 CMP DATE 26.3

			CALCIUM PLAGE DATA					SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT CLASS
76	11	25	14540	S23 E09	108	100	1.5							

MCMATH REGION 14541 CMP DATE 26.8

			CALCIUM PLAGE DATA					SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT CLASS
76	11	29	14541	N04 W38	161	100	2.5							
76	11	30	14541	N04 W51	163	500	3.0							
76	12	2	14541	N04 W80		400	1.0							

MCMATH REGION 14536 CMP DATE 29.4

			CALCIUM PLAGE DATA					SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT CLASS
76	11	23	14536	N00 E80	63	300	1.0							
76	11	24	14536	N01 E66	65	300	1.5							
76	11	25	14536	N01 E51	66	100	1.5							
76	11	27	14536	N01 E20	67	100	1.0							

MCMATH REGION 14537 CMP DATE 29.9

			CALCIUM PLAGE DATA					SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT CLASS
76	11	25	14537	N30 E56	61	100	1.0							

MCMATH REGION 14548 CMP DATE 30.4

			CALCIUM PLAGE DATA					SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT CLASS
76	12	2	14548	N34 W29		200	2.0							

Note: No calcium spectroheliogram was secured at the McMath-Hulbert Observatory on November 26, 1976.
No sunspot observations were made at Mt. Wilson Observatory on November 11, 12, 14 and 27, 1976.

DAILY CALCIUM PLAGE INDEX

NOVEMBER 1976

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
76	11	1	1.4	76	11	11	1.2	76	11	21	10.7
76	11	2	1.3	76	11	12	2.6	76	11	22	10.1
76	11	3	0.6	76	11	13	1.7	76	11	23	10.0
76	11	4	0.3	76	11	14	2.1	76	11	24	9.2
76	11	5	*	76	11	15	3.6	76	11	25	7.2
76	11	6	0.0	76	11	16	2.8	76	11	26	*
76	11	7	0.2	76	11	17	4.3	76	11	27	2.9
76	11	8	0.3	76	11	18	6.6	76	11	28	2.0
76	11	9	0.3	76	11	19	8.1	76	11	29	1.3
76	11	10	0.5	76	11	20	10.3	76	11	30	1.3

* NO OBSERVATIONS

SUDDEN IONOSPHERIC DISTURBANCES

NOVEMBER 1976

DAY	UNIVERSAL TIME				WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE							KNOWN FLARE	McMATH REGION
	START	END	MAX	IMP		SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD		
19	1504U	1525	1508	1	1			1					1500	14528

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION
01-05	0000-2400 TN
01-13	0000-2230 A33
01-30	0000-2400 KA, 0000-2400 A40
01	1050-2115 UM (10 kHz)
02	1440-1514 TM, 1854-1906 TM, 1950-2050 UM (13 kHz)
03	1222-1427 TM, 1950-2050 UM (10 kHz)
04	0000-2400 A41, 2111-2215 UM (10 kHz)
05	0000-2400 A41, 0728-0825 UM (10 kHz)
07	2052-2154 UM (10 kHz)
08	0402-0514 UM (13 kHz), 1913-2036 UM (10 kHz)
12-30	0000-2400 A28
12	1934-2145 UM (10 kHz)
13	1920-2100 UM (10 kHz)
14	1922-2040 UM (10 kHz), 2114-2210 UM (10 kHz)
15	0228-0405 UM (10 kHz), 1755-1840 UM (10 kHz)
16-26	0000-2400 A36
16	0535-0636 UM (10 kHz), 0720-0830 UM (10 kHz)
17	1915-2243 UM (10 kHz)
19-24	0000-2400 A26
19	1015-1455 UM (10 kHz), 1020-1510 UM (10 kHz), 1308-1348 TM, 1910-2026 UM (10 kHz), 2005-2111 UM (13 kHz)
21	1902-2046 TM
22-30	0000-2400 A29
23	0000-2400 A23
24	0442-0530 TM, 1913-2017 UM (10 kHz)
25	0643-0810 UM (10 kHz), 1200-2300 UM (10 kHz), 1852-1955 UM (10 kHz), 2025-2140 UM (10 kHz)
26-30	0000-2400 A4
26	0000-2400 A41, 0642-0810 UM (10 kHz), 1150-1330 UM (10 kHz)
27	0000-2400 A41, 0634-0855 UM (10 kHz), 1900-2000 UM (10 kHz)
28	0000-2400 A41, 0716-0815 UM (10 kHz), 1907-2005 UM (10 kHz)
30	1505-1615 UM (10 kHz)

STATIONS REPORTING FOR NOVEMBER 1976

AAVSO (A1, A4, A19, A21, A28, A29, A30, A31, A33, A34, A35, A36, A37, A40, A41)(SES)
(A1, A26, A31) (SEA) (A31) (SWF)
HERSTMONCEUX (HC) (SEA)
HOBART (TA) (SEA)
HUANCAYO (HU) (SWF)
INUBO (IN) (SPA)
KASUAGE (KA) (SPA)
MCMATH (MC) (SWF, SCNA)
PANSKA VES (PU) (SWF, SEA, SES)
PRESTON (LO) (SEA)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SEA)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
TORINO (TN) (SPA)
UPICE (UI) (SEA)

SID's BY McMATH REGION

NOVEMBER 1976

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
REGION 28																			1											
X-RAY																														
UNKNOWN																														
NO FP																														

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1976

NOV 1976	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0000	0912	MANI										
	0000	0716	CULG				0127	0128	1				IIIG
	0625	1600	DURN										
	0644	1528	WEIS										
	1121	2133	SGMR										
	1333	2345	HARV										
	2152	2400	MANI										
	2016	2400	CULG				2203						IIIB,W
02	0000	0716	CULG										
	0000	0912	MANI										
	0627	1600	DURN										
	0710	1400	WEIS										
	1123	2130	SGMR										
	1332	2345	HARV										
	2048	2400	CULG										
	2152	2400	MANI										
03	0000	0912	MANI										
	0000	0716	CULG										
	0627	1555	DURN										
	0646	0810	WEIS										
	0815	1524	WEIS										
	1124	2129	SGMR										
	1333	2340	HARV										
	2016	2400	CULG										
	2152	2400	MANI										
04	0000	0912	MANI										
	0000	0251	CULG										
	0642	1555	DURN										
	1125	2128	SGMR										
	1332	2340	HARV										
	2144	2400	CULG										
	2153	2400	MANI										
05	0000	0912	MANI										
	0000	0715	CULG										
	0630	1550	DURN										
	0655	1214	WEIS										
	1128	2127	SGMR										
	1240	1306	WEIS										
	1344	2340	HARV										
	2015	2400	CULG										
	2154	2400	MANI										
06	0000	0912	MANI										
	0000	0716	CULG										
	0630	1550	DURN										
	1128	2125	SGMR										
	1345	2340	HARV										
	2016	2400	CULG										
	2154	2400	MANI										
07	0000	0912	MANI										
	0000	0716	CULG										
	0630	1053	DURN										
	1129	2124	SGMR										
	1345	2340	HARV										
	2013	2400	CULG										
	2154	2400	MANI										
08	0000	0912	MANI										
	0000	0716	CULG										
	0635	1545	DURN										
	1131	2123	SGMR										
	1345	2340	HARV										
	2049	2400	CULG										
	2154	2400	MANI										
09	0000	0912	MANI										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1976

NOV 1976	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
09	0000	0720	CULG										
	0635	1545	DURN										
	1110	1515	WEIS										
	1132	2122	SGMR										
	1345	2340	HARV										
	2015	2400	CULG										
	2154	2400	MANI										
10	0000	0912	MANI										
	0000	0716	CULG										
	0635	1545	DURN										
	0715	1245	WEIS										
	1133	2121	SGMR										
	1345	2340	HARV										
	2016	2400	CULG										
	2154	2400	MANI										
11	0000	0912	MANI										
	0000	0716	CULG										
	0635	1545	DURN										
	1110	1307	WEIS										
	1134	2120	SGMR										
	1345	2340	HARV										
	2016	2400	CULG										
	2154	2400	MANI										
12	0000	0912	MANI										
	0000	0716	CULG										
	0635	1027	DURN										
	1039	1545	DURN										
	1040	1218	WEIS										
	1136	2119	SGMR										
	1344	2340	HARV				1748	1749	2	1748	1749	2	IIIG
	2016	2400	CULG				2137	2138	1				IIIG
	2154	2400	MANI										
			CULG				2353		1				IIIB
13	0000	0912	MANI										
	0000	0716	CULG				0436						IIIB,W
	0635	1545	DURN										
			CULG				0643	0644					IIIG,W
	1137	2118	SGMR										
	1345	2340	HARV				1735		1				IIIB
	2154	2400	MANI										
	2016	2400	CULG				2343						IIIB,W
14	0000	0715	CULG										
	0000	0912	MANI										
	0635	1545	DURN										
	1138	2117	SGMR										
	1443	2340	HARV				1748		2	1748		2	IIIG
	2154	2400	MANI										
	2016	2400	CULG				2352.5	2353.5					IIIG,W
15	0000	0717	CULG										
	0000	0911	MANI										
	0635	1539	DURN										
	1139	2116	SGMR										
	1343	2340	HARV										
	2016	2400	CULG				2027						IIIB,W
	2156	2400	MANI										
16	0000	0911	MANI										
	0000	0717	CULG										
	0645	1537	DURN										
	1141	2115	SGMR										
	1347	2340	HARV										
	2017	2400	CULG										
	2156	2400	MANI										
17	0000	0911	MANI										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1976

NOV 1976	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
17	0000	0717	CULG										
	0650	1535	DURN										
	1142	2114	SGMR							1438.4	1438.6	1	III
	1347	2338	HARV				1706		1				IIIB
			CULG	2022.5	2035	1	2022.5	2035	1				IIIGG,U
	2017	2400	CULG	2123	2400	1	2123	2400	1				IIIN
			CULG	2132	2139	1	2132	2139	1				IIIGG,U
			CULG				2155						IIIB
	2156	2400	MANI										
18	0000	0717	CULG	0000	0717	1	0000	0717	1				IIIN
			CULG	0147	0147.5	1	0147	0147.5	2				IIIG
			CULG	0202.5	0203.5	1	0202.5	0203.5	1				IIIG
			CULG	0205	0206.5	1	0205	0206.5	1				IIIG,U
			CULG	0337.5	0338.5	1	0337.5	0338.5	2				IIIG,U
			CULG	0343.5	0344.5	1	0343.5	0347	2				IIIG,U
			CULG	0606	0607.5	1	0606	0607.5	1				IIIG
			CULG	0621	0622	1	0621	0622	1				IIIG,U
			CULG				0707	0708	2				IIIG
	0000	0911	MANI							0802.5	0802.8	2	III
	0653	1532	DURN	1112.7	1112.7	2	1112.7	1112.7	3				III
			DURN	1141.9	1143.7	1	1141.9	1143.7	1				IIIGG
	1143	2113	SGMR										
	1347	2340	HARV				1733		1				IIIG
	2017	2400	CULG	2017	2400	1	2017	2400	1				IIIN
			CULG	2115	2133.5	2	2118	2133.5	2				IIIGG,U
			HARV				2118		1				IIIG
			CULG	2135	2215	1	2135	2215	1				IS
	2157	2400	MANI										
			CULG	2215	2320	1	2215	2335	1				IS
19	0000	0717	CULG	0000	0300	1	0000	0300	1				IIIN
	0000	0911	MANI										
			CULG	0052	0053	2	0052	0053	2				IIIG,U
			CULG	0253.5	0254.5	1	0253.5	0254.5	1				IIIG,U
	0655	1445	DURN	0852.5	0853.0	2	0852.5	0853.0	3				IIIG
			DURN	1117.1	1119.3	2	1117.1	1119.3	3				IIIG
			DURN	1119	1210		1119	1210					IW,N
			DURN	1207	1445	3	1207	1445	3				IC,DC,DP,N
	1348	2340	HARV				1351	2329	1				IN
			HARV				1515	1518	2	1517	1518	2	IIIG
	1145	2113	SGMR							1516.8	1517.0	1	III
			HARV				1603	1604	2	1603	1604	2	IIIG,V
			HARV				1713		1				IIIG
	2154	2400	CULG	2154	2400	1	2154	2400	2				IS,DC
			CULG	2154	2400	1							IIIN
			CULG				2154	2400	1				IIIS
	2157	2400	MANI										
20	0000	0911	MANI										
			CULG				0000	0718	1				IIIS
			CULG	0000	0718	1	0220	0718	1				IS,DC
	0000	0718	CULG				0000	0220	2				IS,DC
			DURN	0950	1323		0950	1323	1				I,N
	0850	1525	DURN				0952.4	0952.9	3				IIIG
	1146	2112	SGMR										
			DURN	1218.6	1218.7	2	1218.6	1218.7	2				III
			DURN				1232.0	1232.1	1				IIIG
			DURN				1330.3	1330.3	2				III
	1347	2340	HARV				1349	1900	1				IN
			HARV				1945	2239	1				IN
	2018	2400	CULG	2018	2400		2018	2400	1				IS,DC
			CULG				2018	2400					IIIS,W
			CULG	2124	2125	1	2123	2126	2				IIIG,U
	2158	2400	MANI										
21	0000	0911	MANI										
			CULG				0000	0718	1				IIIS
	0000	0718	CULG	0000	0718	1	0000	0719	1				IS,DC
			CULG	0111		1	0111		1				IIIB

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1976

NOV 1976	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
21	0702	1523	DURN	0702 D	1523 E	3	0702 D	1523 E	3				I,OC,DP,N
			DURN	0856.8	0856.9	1	0856.8	0856.9	1				IIIG
	1147	2111	SGMR										
	1348	2340	HARV				1348	1500	1				IN
			DURN				1418.2	1418.2	1				III
	2018	2400	CULG				2018	2400	1				IIIS
			CULG	2018	2400		2018	2400					IS,W
	2158	2400	MANI										
			CULG				2326		1				DP
22			CULG				0000	0718					IS,W
	0000	0718	CULG				0000	0140	1				IIIS
	0000	0911	MANI										
			CULG				0140	0718					IIIN,W
	0705	1522	DURN										
	1148	2111	SGMR										
	1348	2340	HARV				1616	1641	2	1616	1641	2	IIIN
			HARV				1707		3	1707		3	IIIG
			HARV				1847	2006	2	1847	2006	2	IIIN
	2018	2400	CULG				2018	2400	1				IIIS
			CULG				2118.5		2				IIIB
	2158	2400	MANI										
			CULG				2320		1				IIIB,U
			CULG	2353	2400	1							IS
23	0000	0719	CULG	0000	0355	1							IS
			CULG				0000	0320					IIIS,W
			CULG				0145	0330	1				IS
			CULG				0213		2				IIIB
			CULG				0236		2				IIIB
			CULG				0246.5		2				IIIB
	0000	0911	MANI							0246.7	0246.8	1	III
			CULG				0320	0719					IIIN,W
	0705	1520	DURN										
	1149	2110	SGMR										
	1348	2340	HARV				1623	1624	2	1623	1624	2	IIIG
			CULG				2019.5	2020	2	2019.5	2020	1	IIIG
	2019	2400	CULG				2020	2400	1				IIIN
			CULG				2056		2				IIIB
			CULG				2059	2059.5	2				IIIG
			CULG	2145	2400	1							IS
	2159	2400	MANI										
24	0000	0911	MANI										
	0000	0715	CULG				0000	0715					IIIN,W
			CULG	0000	0715								IN,W
	0705	1520	DURN	0757	1520	1	0757	1520	1				I,DC,N
	1151	2109	SGMR										
	1348	2340	HARV										
	2020	2400	CULG				2020	2400					IIIS,W
	2159	2400	MANI										
			CULG	2300	2400		2300	2400					IN,W
25	0000	0719	CULG				0000	0200					IIIS,W
			CULG	0000	0200		0000	0200					IS,W
	0000	0911	MANI										
			CULG				0200	0300					IIIN,W
	0708	1517	DURN										
	1152	2108	SGMR										
	1403	2340	HARV										
	2019	2400	CULG				2043						IIIB,W
	2200	2400	MANI										
26	0000	0555	MANI										
	0000	0719	CULG				0126	0128	1				IIIG
	0630	0911	MANI										
	1025	1453	WEIS										
	0710	1517	DURN	1110	1328								IW,N
	1153	2108	SGMR										
	1404	2340	HARV										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1976

NOV 1976	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
26			CULG				2019	2335	1				IN
	2019	2400	CULG				2019	2400					IIIN,W
	2202	2400	MANI										
			CULG				2335	2400	1				IS
27	0000	0719	CULG				0000	0100					IIIN,W
			CULG				0000	0215	1				IS
	0000	0911	MANI										
			CULG				0606	0716					IIIN,W
	0713	1515	DURN										
	0726	1453	WEIS										
	1357	2340	HARV										
	1154	2108	SGMR							1831.8	1832.2	1	III
	2202	2400	MANI										
	2020	2400	CULG				2205						IIIB,W
28	0000	0911	MANI										
	0000	0719	CULG				0032		1				IIIB
			CULG				0120	0129	1				IIIGG
			CULG				0346.5	0350.5	1				IIIGG
			CULG				0445	0448	1				IIIG,V
			CULG				0450	0502	1				IIIGG
			CULG				0507	0508	1				IIIG,U
			CULG				0537	0719	1				IIIN
			CULG				0640	0641	1				IIIG,U
	0729	1452	WEIS				0826.2	0826.3	2				IIIB
	0906	1515	DURN										
	1155	2107	SGMR										
	1700	2340	HARV										
	2020	2400	CULG										
	2203	2400	MANI										
29	0000	0911	MANI										
	0000	0720	CULG										
	0713	1512	DURN										
	0730	0823	WEIS										
	1156	2107	SGMR										
	1553	2340	HARV										
	2020	2056	CULG										
	2110	2400	CULG										
	2203	2400	MANI										
30	0000	0911	MANI										
	0000	0720	CULG				0018						IIIG,W
	0713	1512	DURN										
	1157	2106	SGMR										
	1348	2340	HARV										
	2000	2400	CULG										
	2203	2400	MANI										

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III

RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

COSMIC RAY INDICES

(Neutron Monitors)

NOVEMBER 1976

Nov. 1976	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr
1		7573.7	7136.3	11878.4	9155.6	6432.2	4304.7(40)	3673.4
2		7599.8	7151.3	11974.8	9188.2	6450.8	4309.2	3679.9
3		7621.8	7182.3	12016.4	9212.6	6474.4	4330.6	3683.4
4		7616.5	7182.5	12013.1	9224.4	6451.7	4332.2	3675.0
5		7631.3	7176.1	11962.9	9223.1	6426.0	4325.5	3669.8
6		7605.1	7156.4	11918.0	9165.8	6417.6	4295.2	3672.8
7		7588.8	7136.4	11855.7	9141.0(23)	6413.5	4280.2	3665.2
8		7560.4	7120.8	11822.9	9109.2	6388.5	4263.7	3656.9
9		7531.3	7114.5	11827.2	9122.2	6375.3	4276.5	3663.8
10		7505.8	7091.0	11797.8	9098.5	6362.6	4281.2	3653.2
11		7507.5	7073.1	11776.3	9088.0	6384.8	4286.4	3662.2
12		7508.4	7062.2	11763.4	9066.3	6364.0	4275.8	3658.1
13		7488.8	7031.5	11737.5	9058.2	6338.7	4271.3	3655.5
14		7527.8	7060.2	11772.3	9092.7	6347.1	4276.5	3660.9
15		7562.4	7094.5	11825.9	9112.2	6371.0	4301.4	3672.3
16		7576.4	7101.8	11831.0	9123.3	6386.7	4300.6	3672.7
17		7581.7	7127.1	11846.3(23)	9114.6	6391.3	4299.5	3668.1
18		7539.7	7130.5	11858.6	9110.3	6373.3	4286.3	3662.9
19		7564.9	7120.9	11861.3	9100.4	6363.0	4275.9	3670.0
20		7499.4	7082.8	11749.2	9018.3	6330.8	4254.7	3650.3
21		7469.7	7085.9	11732.1	9023.7	6343.8	4252.3	3650.4
22		7486.0	7083.4	11731.8	9012.2	6357.0	4248.4	3649.8
23		7480.9	7058.5	11687.7	8990.4	6348.4	4243.6	3654.3
24		7484.8	7063.8	11707.3	9016.2	6351.3	4239.3	3660.5
25		7505.3	7054.7	11639.4(20)	9055.2	6328.2	4261.8	3667.4
26		7531.0	7038.4	11722.1	9092.3(21)	6349.3	4289.3	3666.7
27		7557.2	7077.0	11733.8	9078.9	6383.4	4317.0	3676.8
28		7547.3	7082.7	11705.6	9099.7	6369.6	4307.4(28)	3682.8
29		7538.7	7108.4	11665.8	9076.8	6385.4	4284.1	3681.1
30		7566.7	7142.1	11700.1(19)	9122.1	6428.8	4286.3	3669.0
MEAN		7545.3	7104.2	11803.8	9103.1	6382.9	4285.0	3666.2

No observations

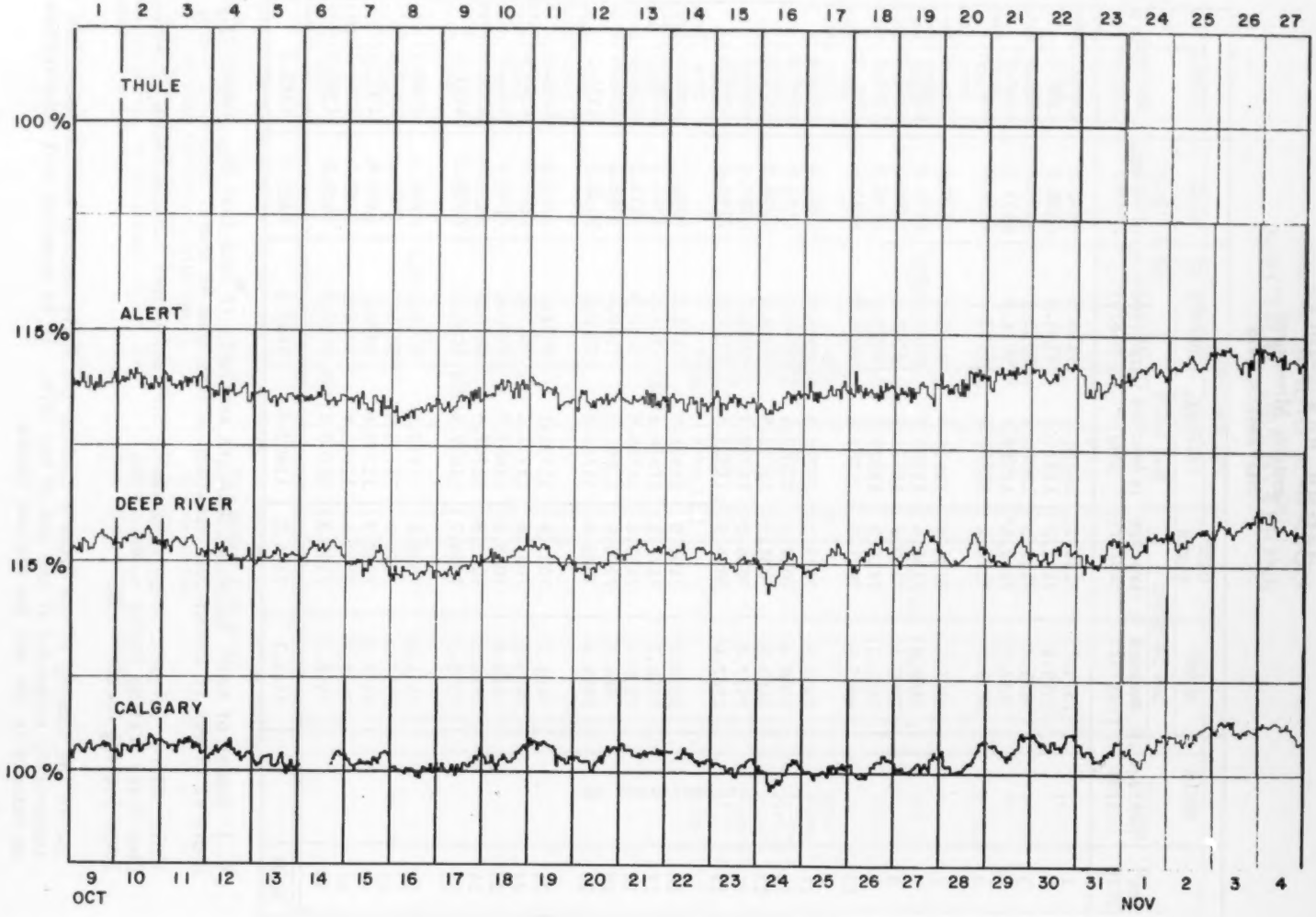
( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

Thule, Alert, Calgary, Sulphur Mountain, Kiel and Climax Scaling Factors = 100.
Deep River Scaling Factor = 300.
Tokyo Scaling Factor = 128.

Due to the closing of the Geopole Station the Thule neutron monitor operations were temporarily suspended at the end of May 1976. It is expected that observations will be resumed in the not too distant future.

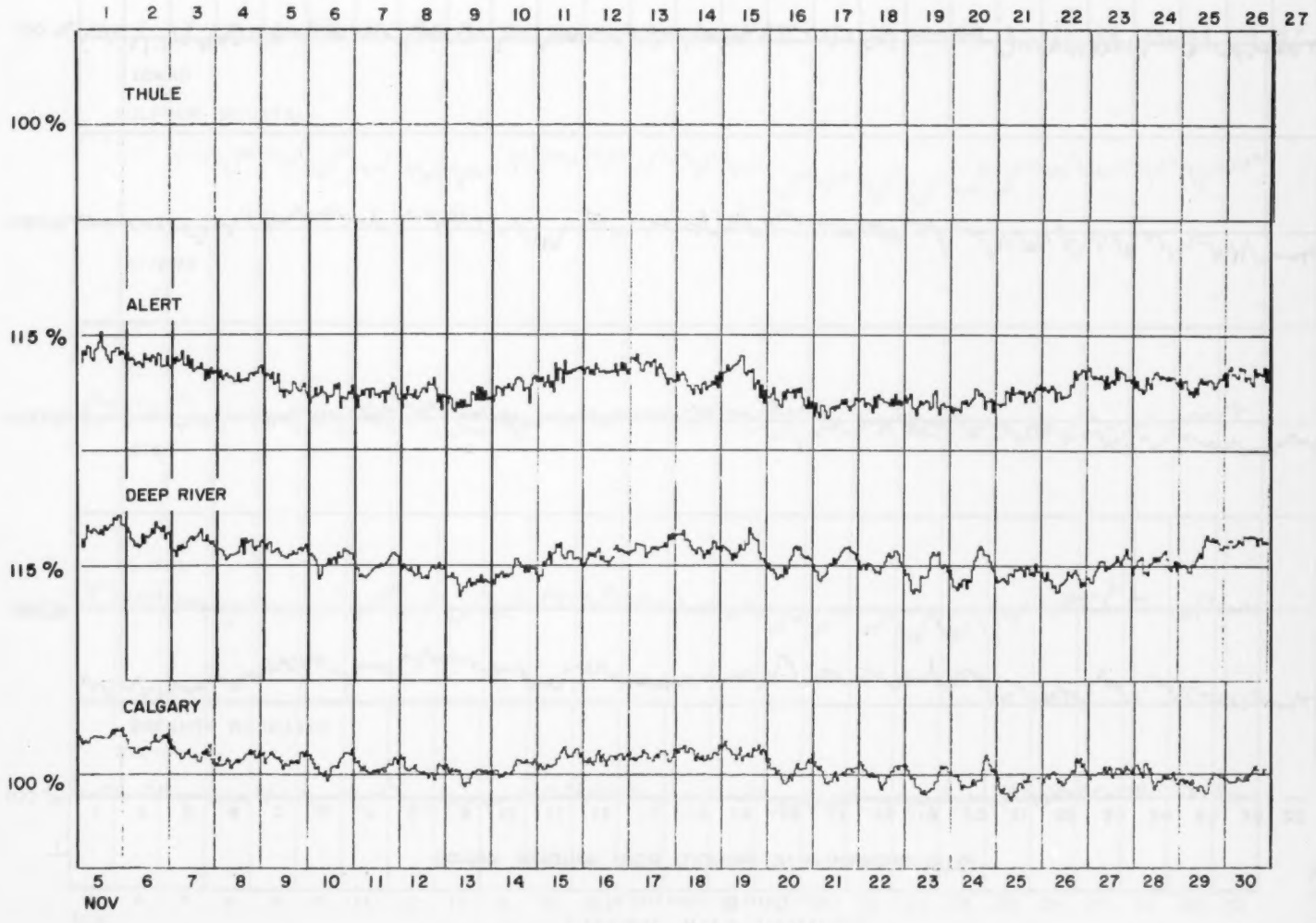
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1958 (October 1976 - November 1976)



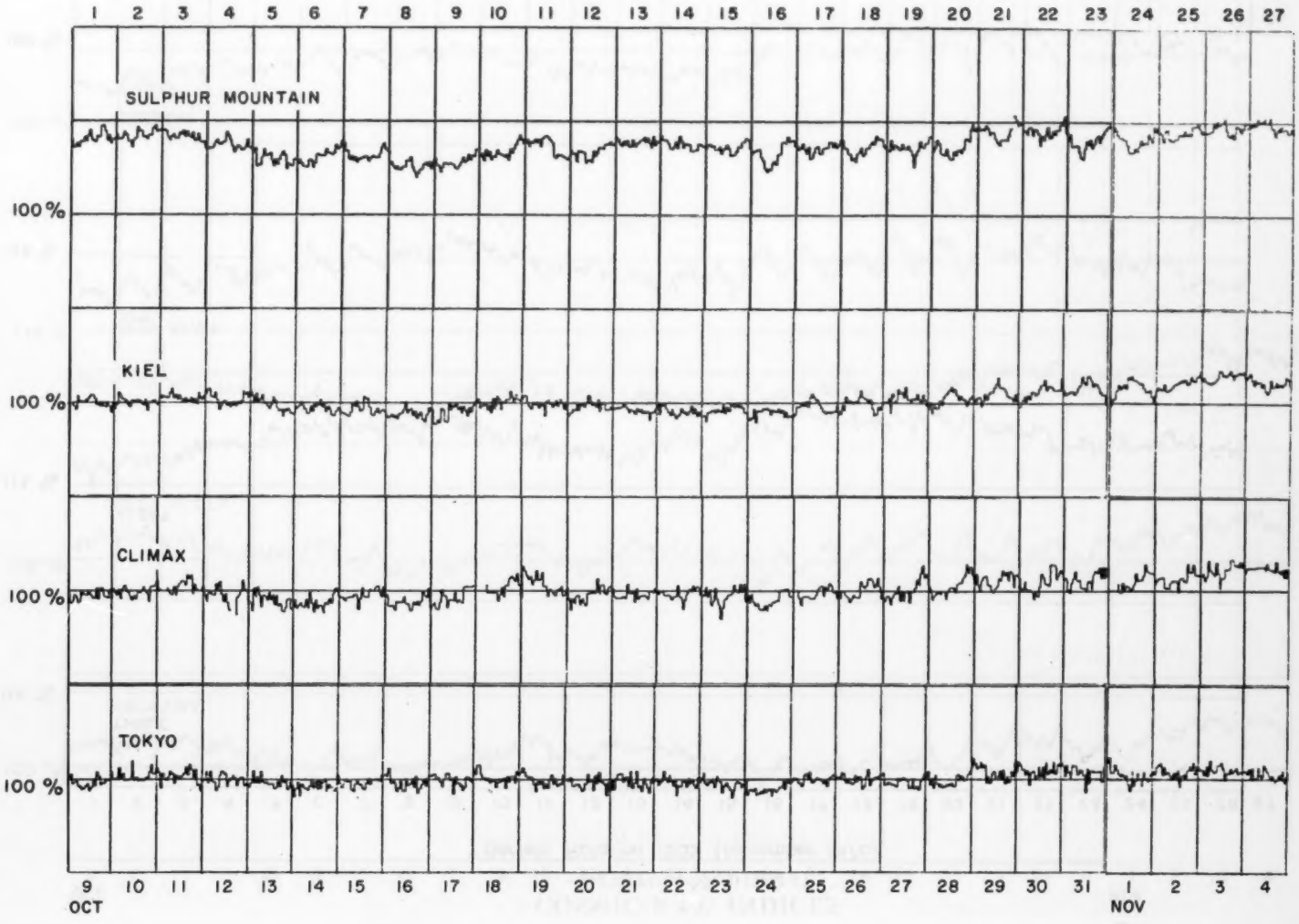
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1959 (November 1976)



COSMIC RAY INDICES
(Neutron Monitors)

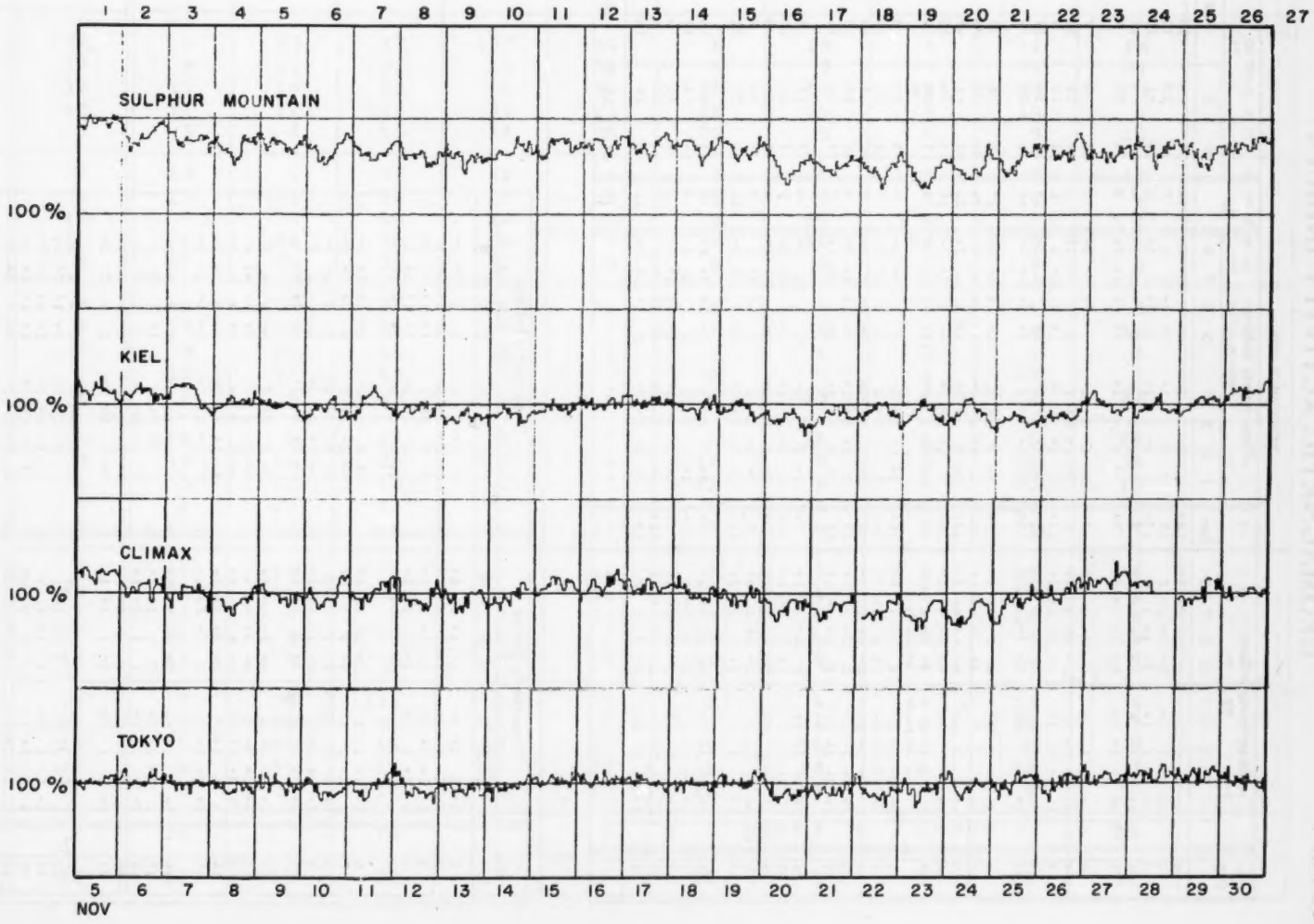
Bartels Rotation 1958 (October 1976-November 1976)



NOV

COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1959 (November 1976)



GEOMAGNETIC ACTIVITY INDICES

NOVEMBER 1976

Day		Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa				Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M		
1		4-	3-	3-	3-	1	1	2+	2+	18+	3+	2	2+	2+	1+	1	2+	2	10	18	14	18	16		0.6
2		2+	3-	2	1+	2-	2+	2-	1	15	2	2	2	1+	2+	3-	2	1	7	17	13	12	18		0.4
3		2+	1	2	1+	1-	1+	1	3	13-	2	1-	2	1+	1+	2-	1	3-	6	19	11	13	17		0.3
4	Q	1+	1	2-	1+	0+	1-	1+	1+	9	1	1+	1+	1+	1-	1+	1+	1+	4	10	9	10	8	CK	0.2
5	QQ	0+	1-	1+	1+	1-	1-	0+	0	5+	0+	1	1+	1+	1+	1+	1-	0+	3	5	10	7	8	CC	0.1
6	QQ	0+	0+	1	0+	0	0	1-	0+	3	1-	1	1	1-	1-	0+	1-	1-	2	3	6	7	3	CC	0.0
7	Q	0	2+	2-	1	0+	0+	0	0+	6	0+	2-	2+	1	1	0	0+	0+	3	4	10	11	3	CC	0.1
8		1	1-	0	0+	1-	2	2+	3+	10+	1	1-	0	0+	1+	2	2+	3	6	11	12	6	17	KK	0.3
9		3-	3+	2-	2-	2-	1	1	2	15	3-	2+	2-	2-	1+	1	1	2-	8	15	14	17	13		0.4
10	0	2+	3	3	3-	3-	3-	4+	5-	25+	2-	3-	3-	3	3+	3+	4+	4-	18	36	29	20	46		1.0
11	0	3	4-	3-	3	4	5	4+	3-	28+	2+	3	2+	3	4-	4+	4-	3-	23	40	38	23	55		1.1
12	0	5+	3	3	3	3+	3+	4-	4+	29	4	2+	2+	3-	3+	3+	4	4-	24	38	23	28	34		1.2
13	0	4+	4	3	4+	4+	4+	4+	3-	33+	3+	3	4-	4+	4+	4	4	3-	31	50	46	47	50		1.3
14	0	4-	2-	2	2+	4-	4-	4	3-	24-	3	1+	2-	2+	4-	3	3+	2+	16	28	24	18	34		0.9
15		3	3-	1+	2	3-	3-	2	1-	17	2+	2-	1	2-	3-	3-	2+	1+	9	17	16	15	19		0.5
16		1-	2-	2-	1+	2	2-	1	1+	11+	1-	1+	1+	1+	2	2	1+	1+	5	9	13	8	14	C	0.2
17		3-	3-	2-	2-	1+	1	1+	2-	14	2	2-	2-	2	2-	1	1+	2-	7	11	14	15	10	CC	0.4
18	Q	2+	2-	1-	1-	1-	0+	2	2-	10	2-	1	0+	0+	1-	0+	2	2-	5	12	8	10	10	CK	0.2
19		2+	3+	2-	1+	2	2-	2+	2+	17	2	2+	1+	1+	2-	2+	3-	2+	9	16	19	19	17		0.5
20		2+	2+	1+	2+	2	1-	3-	1+	15	2	2	1+	2+	2-	1	3-	1+	7	13	15	16	13		0.4
21	Q	1+	2-	1-	0+	1	0+	1	1+	8-	1-	1	1	1-	1	1	1	1+	4	7	12	10	9	CC	0.1
22	Q	1	2+	1+	1	1+	1-	2-	1+	11-	1	2-	2-	1+	1+	1	2-	1+	5	7	12	13	8	CC	0.2
23	QQ	1+	1-	1	0+	1-	1	1	2-	8-	1-	1	1	1-	1+	1	1+	1+	4	7	11	9	9	CC	0.1
24	QQ	0+	2	0+	1	1-	0+	0	0+	5	1-	1+	0+	1	1	0+	0+	1	3	3	10	7	6	CK	0.0
25		1+	3	3	3	2+	3	2+	2-	20-	2-	3-	2+	3-	2+	3	2+	2-	11	18	22	21	20		0.6
26		2+	3-	1-	1+	1+	2	4-	3-	17-	2-	2	1-	2	2-	2+	3+	2+	9	15	17	14	19		0.5
27		3-	4-	3-	1	0+	1-	2-	2	15-	2+	3	2+	1	1	1	2-	2	8	14	14	17	12	K	0.5
28	QQ	0+	1-	0+	0+	0+	1-	1-	0	3+	0+	1-	0+	1-	1-	1+	1+	1-	2	3	11	6	8	CC	0.0
29		0	1-	2+	1+	1	2+	1+	2+	11+	0+	1-	2	2-	2-	2+	1+	2	6	13	13	9	17	CK	0.2
30		3	4-	2	2-	2+	3	1	2	19-	2+	3-	2-	2-	2	3+	1+	2+	11	18	20	19	20		0.6
																			9	16.0	16.2	16.2			0.43

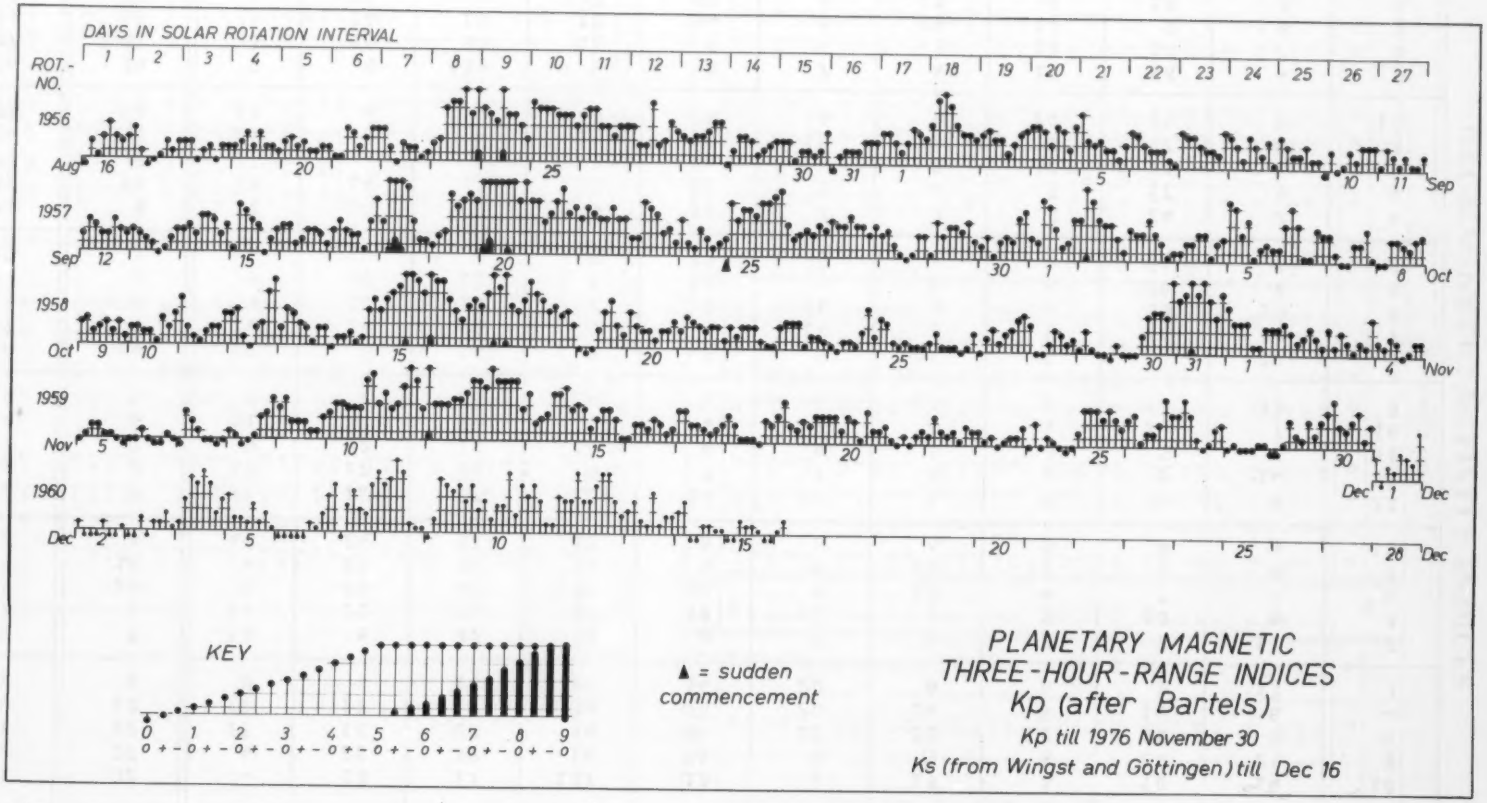
Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	3+	2	2+	3-	1+	1+	2+	2+	3	2-	2	2	1	1	3-	2-
2	2-	2	2	2-	2+	3-	2	1+	2+	2-	2-	1	2+	3-	2	1
3	2	1-	2+	2-	1	2-	1	3-	2	1	1+	1	1+	1+	1	3-
4	1	1+	1	1+	1-	1	1+	1+	1	2-	2-	1-	1-	1+	1+	1
5	0	1	2-	1	1	1	0+	0	0+	1	1+	1+	2-	2-	1-	1-
6	0+	1-	1	1	1-	0+	1-	0+	1-	1	1-	1-	1-	0+	1-	1-
7	0	2-	2	1	1-	0	0	0+	1-	2-	2+	1	1	0+	1-	1-
8	1-	0	0	0	1	2	2	3	1	1	3+	1-	1+	2	3-	3+
9	2+	2+	2-	2	2-	1	1	2-	3-	2+	2-	2-	1+	1	1	2
10	1+	3-	3-	3	3+	3	4+	4-	2-	2+	3-	3-	4-	3+	4+	4
11	2+	3	2+	3	4-	5-	4-	2+	2+	3	2+	3	4-	4	4	3
12	5-	2+	3-	3	4-	3+	4-	4-	4-	2	2	3-	3+	4-	4+	4-
13	3+	3+	4+	5-	4+	4	4-	2+	4-	3	3	4	4+	4	4	3-
14	3	1	1+	2	3+	3+	3+	3-	3	1+	2-	3-	4	3	3+	2+
15	2+	2-	1-	2	3	3-	2+	1-	2	2-	1	2-	3-	3-	2+	2-
16	1-	1	1+	1+	2+	2	1	1-	1	1+	1	1+	2	2	2-	2-
17	2	2-	2-	2+	2	1	1+	1+	2	2-	2-	2	1+	1	2-	2
18	2-	1	0+	1-	1	0	2-	1+	2-	1	1-	0+	1-	1	2+	2
19	2	2+	1+	1	2-	2-	3-	2+	2	2	2-	1+	2	3-	3-	3-
20	2-	2	1	2+	2-	1	2+	1	3-	2	1+	2+	2	1	3	1+
21	1-	1	1	1-	1	1-	1	1	1	1+	1+	1-	1	1+	1	1+
22	1	2-	2-	1	1+	1-	1+	1	1	2-	2	1+	1+	1+	2-	1+
23	1-	1	1	0+	1	1-	1	1	1	1-	1+	1-	1+	1+	2-	2-
24	0	1	0+	1	1	0	0	0+	1+	2-	1-	1+	1+	1-	1-	2-
25	1	2+	2+	3	2+	3-	2	2-	2	3-	3-	2+	2+	3	2+	2-
26	2-	2-	0+	2-	2-	2-	3+	2+	1+	2+	1	2	1+	3-	3+	2+
27	2	3	2	1	1	1-	2-	2-	3-	3	2+	1	1+	2-	2-	2
28	0	0+	0	1	1-	1+	1-	0	0+	1	1-	0+	1-	1+	2	1+
29	0	0+	2+	2-	1+	2+	1+	2	1-	1+	2-	1+	2	3-	2-	2-
30	2+	3-	2-	2	2	3+	1	2	3-	3-	1+	2-	2	3+	1+	3-

DAILY AVERAGE INDICES Ap

DAILY AVERAGE INDICES Ap

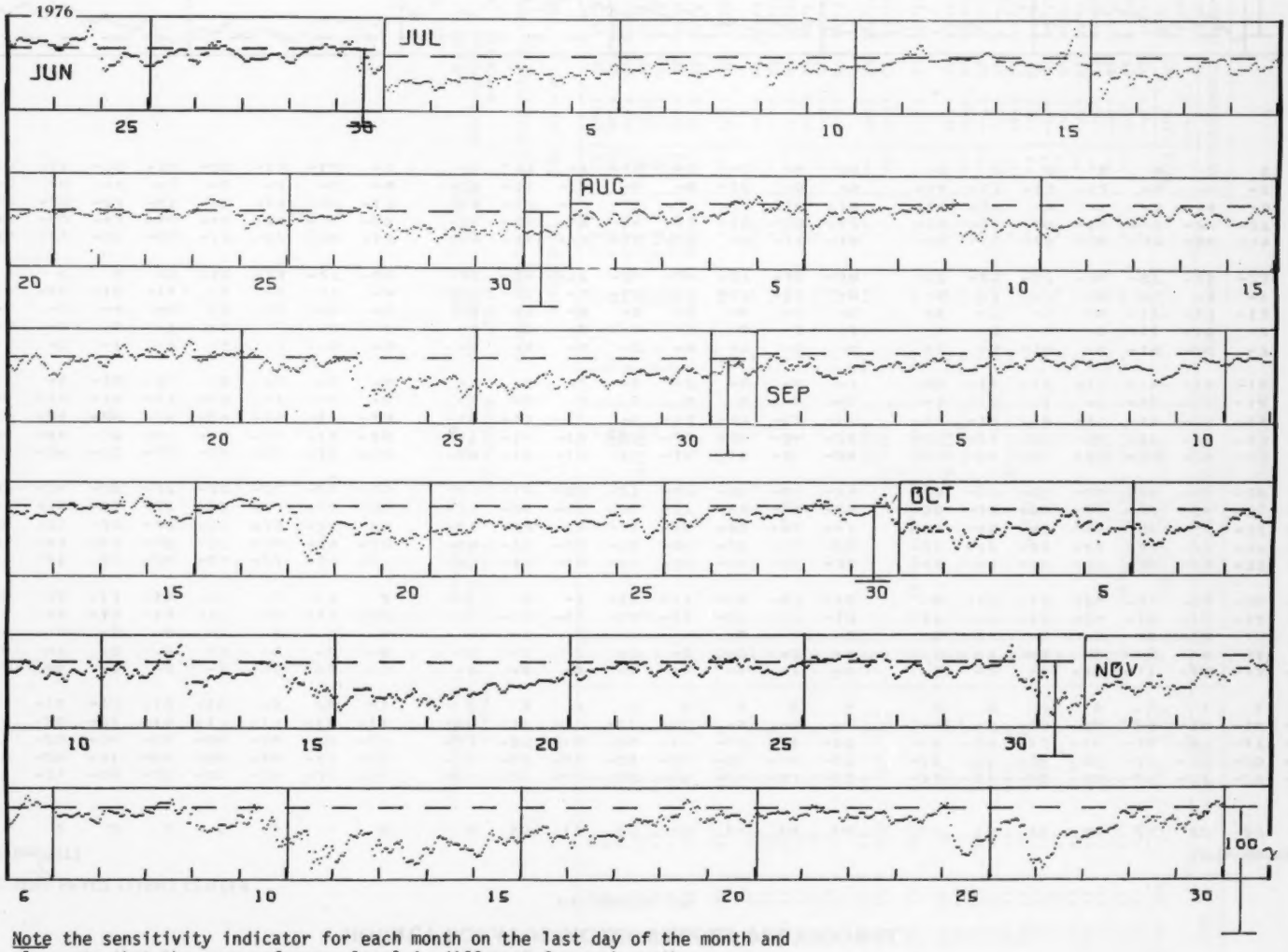
	1975	1976										
DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	32	4	23	17	107	10	6	18	8	10	14	10
2	27	4	20	32	16	58	6	9	8	24	21	7
3	12	15	16	27	44	94	12	12	10	10	9	6
4	13	10	12	12	30	20	20	14	5	14	6	4
5	8	9	8	15	27	14	20	6	6	9	13	3
6	7	13	8	33	30	8	7	6	5	7	11	2
7	4	11	21	26	27	10	13	9	5	10	6	3
8	18	5	29	42	14	10	8	13	4	7	6	6
9	16	4	24	36	16	4	4	10	12	6	6	8
10	8	47	24	32	12	6	6	6	9	5	6	18
11	5	40	12	27	12	11	26	4	5	4	8	23
12	3	13	17	26	9	7	7	5	3	8	14	24
13	3	9	22	11	13	6	4	4	3	5	8	31
14	6	11	17	14	15	4	3	6	4	10	7	16
15	9	7	8	15	4	5	4	19	2	10	33	9
16	14	10	6	18	8	5	5	16	6	6	29	5
17	9	14	14	20	5	4	14	5	5	10	30	7
18	6	9	22	13	2	3	21	6	4	33	19	5
19	6	8	25	11	5	12	4	6	6	20	7	9
20	3	11	19	8	2	19	5	4	5	51	7	7
21	9	20	14	5	5	11	3	3	8	24	7	4
22	10	23	14	3	19	11	3	4	5	17	5	5
23	7	20	4	5	8	14	4	5	30	12	6	4
24	2	21	3	4	16	6	16	4	25	7	6	3
25	18	10	4	4	9	9	18	9	24	24	5	11
26	34	5	9	138	6	6	7	4	18	13	4	9
27	31	6	26	35	11	5	6	8	13	12	7	8
28	15	5	20	15	10	14	5	16	10	5	5	2
29	15	6	34	15	17	22	5	18	6	10	3	6
30	11	9		12	10	17	29	19	6	9	16	11
31	7	29		10		9		7	5		34	
MEAN	12	13	16	22	17	14	10	9	9	13	12	9

GEOMAGNETIC ACTIVITY INDICES


DAYS IN SOLAR ROTATION INTERVAL
ROT.-NO.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
1956
Aug 16 20 25 30 31 1 5 10 11 Sep
1957
Sep 12 15 20 25 30 1 5 8 Oct
1958
Oct 9 10 15 20 25 30 31 1 4 Nov
1959
Nov 5 10 15 20 25 30 Dec 1 Dec
1960
Dec 2 5 10 15 20 25 28 Dec
KEY
0 1 2 3 4 5 6 7 8 9
0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp (after Bartels)
Kp till 1976 November 30
Ks (from Wingst and Göttingen) till Dec 16

GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst



Note the sensitivity indicator for each month on the last day of the month and also note that the zero reference level is different for each month.

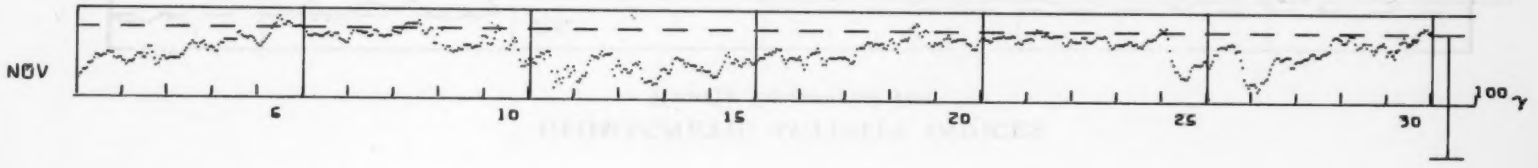
HOURLY EQUATORIAL Dst VALUES (PROVISIONAL)

NOVEMBER 1976

NASA/GODDARD SPACE FLIGHT CENTER

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-41	-39	-38	-35	-35	-34	-30	-30	-29	-26	-23	-23	-25	-25	-23	-23	-21	-21	-22	-22	-26	-27	-25	-26
2	-28	-29	-31	-29	-28	-28	-27	-24	-22	-22	-23	-25	-26	-22	-16	-17	-22	-27	-32	-30	-27	-24	-25	-27
3	-27	-25	-26	-26	-26	-26	-25	-23	-23	-20	-18	-15	-14	-12	-14	-15	-17	-14	-13	-12	-16	-20	-17	-16
4	-18	-20	-21	-15	-13	-13	-10	-11	-10	-11	-11	-11	-10	-5	-4	-7	-9	-9	-10	-8	-9	-10	-12	-14
5	-16	-16	-13	-12	-10	-8	-6	-1	2	3	7	9	5	1	2	4	3	2	0	0	0	1	1	-1
6	-2	-4	-7	-8	-8	-6	-6	-7	-8	-8	-8	-6	-5	-4	-7	-8	-5	-5	-6	-10	-11	-12	-13	-13
7	-9	-5	-3	0	-3	-4	-3	-5	-5	-5	-7	-7	-6	-2	-2	-4	-7	-7	-8	-8	-6	-6	-6	-2
8	-4	-3	-5	-4	-1	1	3	4	3	4	3	3	4	6	2	-3	-5	-4	-2	0	-1	-13	-12	-5
9	0	-2	-15	-18	-18	-15	-19	-20	-18	-18	-16	-18	-18	-13	-13	-13	-14	-16	-15	-14	-15	-15	-12	-6
10	-6	-6	-13	-14	-12	-3	-3	2	-2	0	-1	-11	-17	-18	-13	-10	-8	-11	-18	-26	-31	-30	-26	-29
11	-24	-25	-28	-29	-22	-22	-19	-21	-25	-18	-18	-22	-35	-48	-42	-34	-41	-44	-39	-32	-30	-39	-35	-30
12	-34	-43	-43	-40	-37	-38	-35	-28	-25	-21	-23	-22	-24	-20	-18	-22	-20	-20	-20	-19	-33	-38	-29	-25
13	-30	-35	-32	-33	-35	-35	-33	-28	-27	-29	-26	-32	-40	-43	-42	-41	-41	-45	-43	-43	-39	-37	-32	-31
14	-33	-35	-35	-32	-27	-23	-22	-24	-25	-24	-27	-30	-27	-29	-29	-29	-30	-33	-32	-30	-33	-34	-33	-34
15	-37	-39	-37	-37	-35	-32	-29	-25	-20	-18	-22	-27	-27	-23	-25	-29	-30	-27	-26	-23	-24	-26	-28	-26
16	-26	-24	-22	-22	-22	-19	-19	-18	-20	-17	-18	-15	-16	-16	-21	-24	-27	-24	-22	-23	-23	-24	-23	-21
17	-24	-28	-32	-27	-21	-19	-18	-18	-17	-14	-18	-23	-28	-28	-24	-22	-22	-22	-22	-22	-21	-22	-23	-21
18	-23	-24	-26	-26	-24	-19	-14	-13	-14	-13	-11	-9	-10	-10	-12	-10	-10	-12	-10	-10	-14	-15	-11	-7
19	-6	-10	-15	-17	-10	-7	-7	-6	-8	-5	0	3	4	6	4	-2	-4	0	1	-1	-10	-12	-12	-9
20	-11	-9	-10	-12	-6	-5	-3	-6	-8	-7	-8	-6	-7	-6	-6	-7	-10	-11	-12	-15	-14	-14	-10	-7
21	-5	-5	-7	-7	-9	-7	-5	-5	-4	-4	-4	-3	-5	-5	-5	-4	-3	-5	-10	-8	-10	-10	-7	-6
22	-6	-5	-5	-7	-1	2	0	1	-4	-3	-2	-4	-5	-4	-3	-3	-4	-3	-4	-9	-11	-10	-8	-6
23	-8	-8	-9	-8	-6	-4	-4	-4	-8	-9	-9	-7	-6	-4	-4	-5	-5	-3	-5	-8	-11	-13	-12	-10
24	-10	-10	-10	-11	-9	-9	-7	-8	-10	-10	-9	-12	-11	-13	-10	-8	-6	-7	-7	-5	-5	-3	-1	3
25	1	0	3	-5	-19	-23	-27	-32	-32	-34	-37	-36	-38	-37	-35	-30	-27	-25	-27	-26	-27	-25	-23	-22
26	-26	-28	-25	-22	-17	-17	-12	-11	-12	-11	-13	-10	-10	-9	-11	-16	-14	-15	-22	-28	-38	-42	-44	-41
27	-42	-40	-43	-48	-45	-39	-39	-37	-36	-32	-28	-24	-21	-19	-20	-22	-21	-20	-19	-19	-20	-28	-27	-23
28	-22	-23	-23	-21	-20	-20	-19	-17	-16	-17	-19	-20	-20	-17	-16	-16	-15	-14	-8	-4	-3	-4	-5	-6
29	-8	-8	-7	-5	-2	-2	-3	-9	-13	-11	-10	-8	-8	-12	-8	-9	-14	-17	-13	-13	-9	-9	-7	-10
30	-18	-14	-13	-18	-20	-13	-12	-7	-6	-3	-7	-10	-8	-7	-4	-6	-4	0	2	2	4	3	1	2



PRINCIPAL MAGNETIC STORMS

NOVEMBER 1976

OBS. 2 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
CO	64.6N	10	03--	..	..	..	..	10(4) 11(4,5,6)	6	182	1100	770	12	03
NE	55.1N	10	02--	..	..	..	..	11(2) 12(1) 13(2,5)	5	41	80	122	15	15
WI	54.2N	10	17--	..	..	..	..	11(6) 12(1)	6	29	175	60	13	23
BD	48.9N	10	05--	..	..	..	..	12(1)	5	27	88	48	14	22
JP	17.3N	10	07--	..	..	..	..	--	-	5	120	16	13	20
SH	14.6N	10	07--	..	..	..	..	--	-	4	113	12	13	20
UJ	13.5N	10	07--	..	..	..	..	--	-	4	134	13	13	20
AL	09.5N	10	07--	..	..	..	..	10(7) 13(2,6)	5	4	118	17	13	20
HD	07.6N	10	0500	..	..	..	..	11(5,6)	5	3	134	14	12	02
AN	01.5N	10	07--	..	..	..	..	--	-	4	122	44	13	20
TV	01.1S	10	07--	..	..	..	..	--	-	3	131	90	13	20
KG	56.5S	10	09--	..	..	..	..	13(5)	6	--	--	--	14	20
HU	0.6S	10	1150	..	..	..	..	11(5,6)	5	10	204	51	13	20
GN	43.2S	11	04--	..	..	..	..	12(6) 13(4,5) 14(5)	5	16	70	120	14	20
CO	64.6N	12	1025	SC	..	..	..	13(4,5)	7	210	1650	830	13	21
HD	07.6N	12	0500	..	..	..	..	13(6)	5	4	90	17	13	22
JP	17.3N	14	08--	..	..	..	..	--	-	3	46	19	15	19
SH	14.6N	14	08--	..	..	..	..	--	-	2	43	11	15	19
UJ	13.5N	14	08--	..	..	..	..	--	-	3	77	24	15	19
AL	09.5N	14	08--	..	..	..	..	14(5) 15(2,6)	4	3	44	22	15	19
AN	01.5N	14	08--	..	..	..	..	--	-	2	61	30	15	19
TV	01.1S	14	08--	..	..	..	..	--	-	2	81	51	15	19
HU	0.6S	26	1030	..	..	..	..	26(6)	5	6	154	50	26	23
JP	17.3N	30	0505	SC	- 0.2	9	- 3	--	-	2	47	14	30	23
SH	14.6N	30	0505	SC	- 0.0	8	2	--	-	1	30	8	30	23
UJ	13.5N	30	0505	SC	- 0.1	12	- 3	--	-	2	38	17	30	23
AL	09.5N	30	0505	SC	- 0.1	10	- 1	30(2,6)	4	1	50	23	30	23
HD	07.6N	30	0505	SC	- 0.1	+11	- 1	30(6)	4	2	50	18	30	23
AN	01.5N	30	0505	SC	- 0.5	7	6	--	-	3	56	43	30	23
TV	01.1S	30	0505	SC	0.0	17	19	--	-	3	80	72	30	23

JP = Jaipur SH = Shillong UJ = Ujjain

Reports were received from the following observatories:

College Witteveen Alibag Annamalaingar Trivandrum Gnangara
Sitka Fredericksburg San Juan Hyderabad Huancayo Port Moresby Toolangi
Newport Boulder Honolulu Guam Hermanus Port-aux-Francais

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

NOVEMBER 1976

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romana)
The meaning of the station symbols is given in the IAGA-Bulletins nr. 32. Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc)

none

Solar-flare effects (sfe)

Effects confirmed by ionospheric or solar observations are underlined.

12 0639 - 0645 SO
16 0424 - 0435 SO

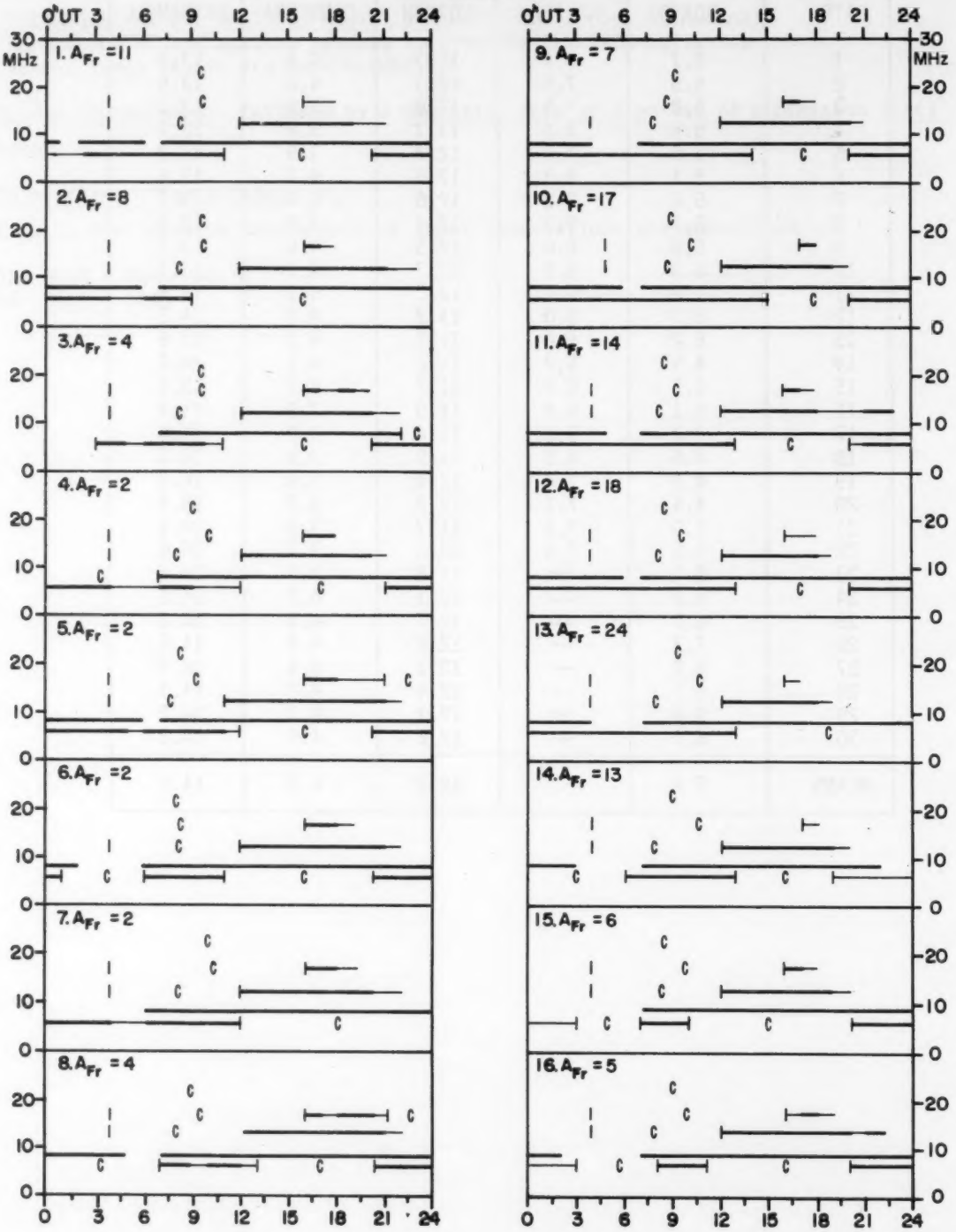
RADIO PROPAGATION QUALITY INDICES

NOVEMBER 1976

DATE	TOKYO	HALIFAX	MOSCOW	CANBERRA	BRACKNELL
1	5.7	7.9	12.3	4.5	13.9
2	5.5	7.6	12.3	4.0	13.5
3	5.8	7.5	12.8	3.9	13.3
4	5.6	7.6	13.3	3.8	12.9
5	5.5	7.3	12.3	3.9	13.2
6	5.1	8.3	12.5	4.7	13.6
7	5.6	8.2	12.6	4.4	13.7
8	6.2	9.3	12.4	3.8	13.9
9	6.9	8.0	12.5	4.6	13.7
10	6.8	8.0	12.7	4.1	13.7
11	7.9	6.7	12.7	5.1	13.5
12	5.7	6.0	11.2	4.4	14.3
13	5.2	6.8	11.7	4.2	13.9
14	4.9	5.2	11.2	4.1	14.2
15	4.5	5.5	11.7	4.2	13.1
16	5.1	6.4	11.9	3.9	14.2
17	4.4	7.0	11.4	3.9	14.6
18	4.6	6.5	11.9	3.5	14.2
19	4.9	7.4	12.4	3.9	14.2
20	4.4	7.1	12.2	3.7	13.9
21	5.3	7.4	11.7	3.8	14.1
22	5.6	7.8	12.3	3.7	14.6
23	6.1	--	11.8	3.8	14.7
24	6.2	--	12.1	4.2	14.7
25	6.7	--	12.7	4.5	14.6
26	7.2	--	12.2	4.4	14.6
27	5.9	--	12.1	4.4	14.5
28	4.7	--	12.4	4.4	14.3
29	5.8	--	12.1	4.3	14.2
30	6.7	--	12.2	4.6	14.8
MEANS	5.7		12.2	4.2	14.0

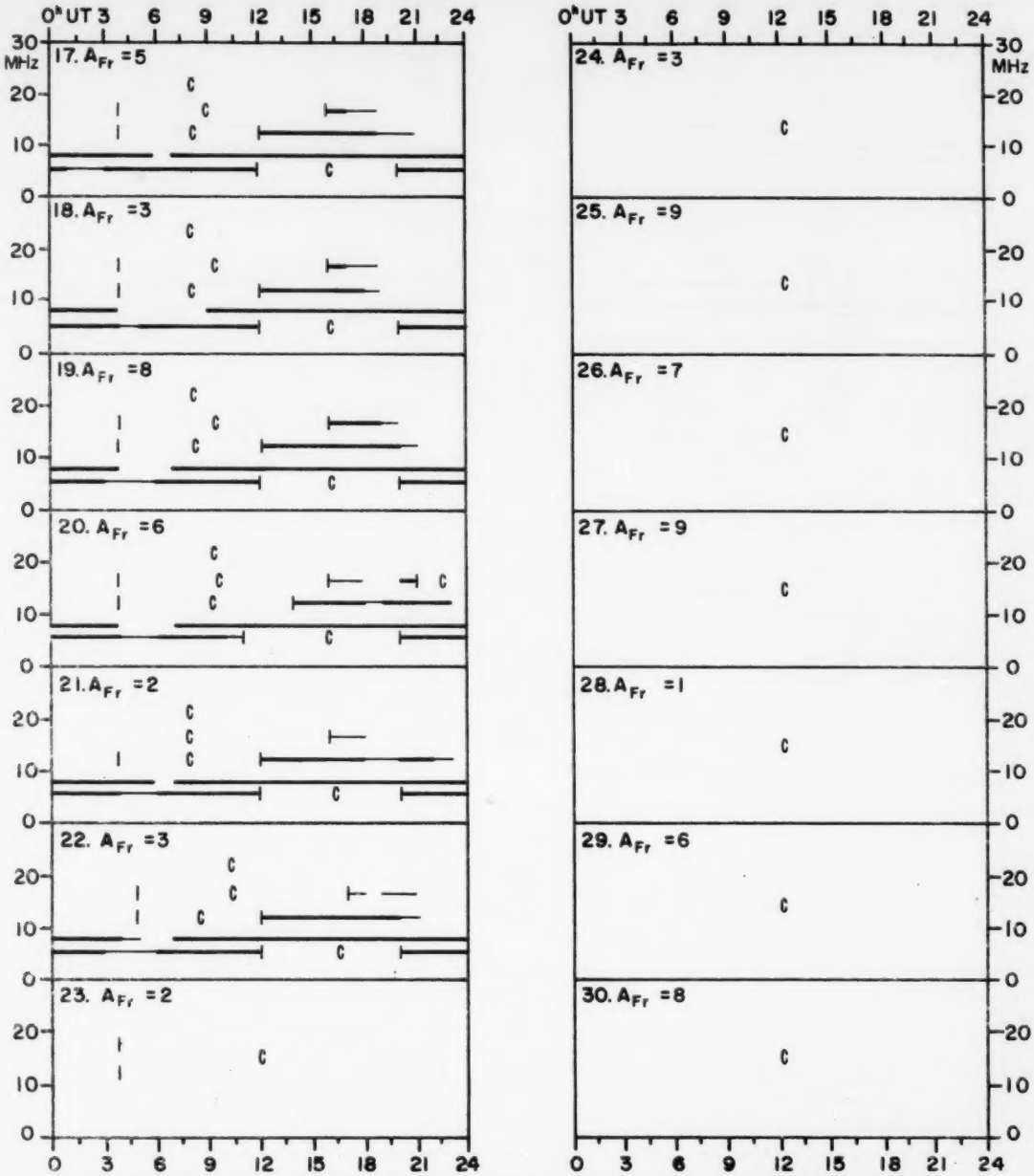
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

NOVEMBER 1976



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

NOVEMBER 1976



Field strengths from five frequencies, 6.425, 8.542, 12.813, 17.084 and 22.378 MHz, observed on a Lüchow - Halifax circuit are represented above. Heavy solid lines represent field strengths ≥-12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line.

Adapted from Observations by Deutsche Bundespost

C = no value because of technical trouble or interference.

USCOMM-NOAA-ASHEVILLE--1-77--950

January 1977 Number 389-Part II

PA STACKS

FEB 24 1977

Solar-Geophysical Data comprehensive reports

Data for July 1976–June 1976 & Miscellanea

Explanation of Data Reports Issued as Number 378 (Supplement) February 1976

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA SERVICE / ASHEVILLE, N.C.

U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Robert M. White. Administrator
ENVIRONMENTAL DATA SERVICE
Thomas S. Austin, Director

Solar - Geophysical Data

NO. 389 JANUARY 1977

Part II (Comprehensive Reports)

DATA FOR
JULY 1976
JUNE 1976
& MISCELLANEA

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

For obtaining bulletins on a data exchange basis, send request to: World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado 80302.

For sale through the National Climatic Center, Federal Building, Asheville, NC 28801, Attn: Publications. Subscription Price: $34.00 annually for both Part I (Prompt Reports) and Part II (Comprehensive Reports) or $18.00 annually for either part. Annual supplement containing explanation is included. For foreign mailing add $32.00 for both parts or $16.00 for either part. Single issue price $1.50 for either part and $1.40 for the extra issue. Make checks and money orders payable to: Department of Commerce, NOAA.

To standardize referencing these reports in the open literature, the following format is recommended:

Solar-Geophysical Data, 366 Part I (or Part II), pages, February 1975, U.S. Department of Commerce, (Boulder, Colorado, U.S.A. 80302)

SOLAR - GEOPHYSICAL DATA

No. 389

Issued in two parts

Hope I. Leighton, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

CONTENTS

Part I (Prompt Reports)

	Page
Index for 1975 and 1976	2
Data for December 1976	3-22
Data for November 1976	23-111

Part II (Comprehensive Reports)

Index for 1975 and 1976	2
Data for July 1976	3-16
Data for June 1976	17-26
Miscellaneous Data	27-34

Solar Wind - Imp 8 -- June 1976
Radio Emission - Spectral -- Culgoora
September and October 1976

INDEX FOR 1975 - 1976 DATA PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

	1975 Aug	Sep	Oct	Nov	Dec	1976 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
A.	**Solar and Interplanetary Phenomena**																
A.1	Sunspot Drawings	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.2a	ZÜrich Provisional Relative Sunspot Numbers R_Z	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.2b	ZÜrich Final Sunspot Numbers R_Z	378A 6	378A 6	378A 6	378A 6	378A 6												
A.2c	American Relative Sunspot Numbers R_A'	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.3a	Mt. Wilson Magnetograms	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.3b	Mt. Wilson Magnetic Characteristics of Sunspots	374A 90	375A 84	376A 90	377A 86	378A 90	379A 88	380A 94	381A 92	382A 86	383A 88	384A 84	385A 88	386A 84	387A 86	388A 88	389A 86	
A.3c	Kitt Peak Magnetograms	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	---	---	---	---	386A 22	387A 26	388A 26	389A 26	
A.4	Mu Spectroheliograms	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.5	Calcium Plage Drawings - McMath (or Catania)	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.5a	Calcium Plage (McMath) and Sunspot Regions	374A 90	375A 84	376A 90	377A 86	378A 90	379A 88	380A 94	381A 92	382A 86	383A 88	384A 84	385A 88	386A 84	387A 86	388A 88	389A 86	
A.5b	McMath Daily Calcium Plage Indices	374A 95	375A 90	376A 96	377A 92	378A 94	379A 93	380A100	381A 97	382A 91	383A 94	384A 90	385A 93	386A 89	387A 93	388A 94	389A 90	
A.6	Ha Synoptic Charts	379B 14	380B 12	376A 27	377A 25	378A 27	379A 25	380A 33	381A 29	382A 25	383A 25	384A 23	385A 24	386A 20	387A 26	388A 26	389A 26	
A.7b	Coronal Line Emission	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.7Y	Helium D3 Chromosphere (Big Bear)	---	---	---	---	---	379A 23	379A 21	380A 30	381A 24	382A 21	383A 21	384A 19	385A 21	---	387A 20	388A 21	389A 21
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.8g	Daily Values of Adjusted Solar Flux (AFRL)	373A 7	374A 7	375A 7	376A 7	377A 7	378A 7	379A 7	380A 7	381A 7	382A 7	383A 7	384A 7	385A 7	386A 7	387A 7	388A 7	389A 7
A.9cb	8.6 mm Radio Maps of the Sun (NELC - La Posta)	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.9d	2 cm Radio Maps of the Sun (NELC - La Posta)	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.10a	169 MHz - Interferometric Observations (Nançay)	373A 15	374A 12	375A 12	376A 14	377A 12	378A 13	379A 12	380A 15	381A 13	382A 12	383A 13	384A 12	---	386A 12	387A 12	388A 12	389A 12
A.10c	21 cm East-West Solar Scans (Fleurs)	373A 17	374A 14	375A 14	376A 16	377A 16	378A 17	379A 14	380A 17	381A 15	382A 14	383A 15	384A 14	385A 14	387A101	388A101	388A 14	389A 14
A.10d	43 cm East-West Solar Scans (Fleurs)	373A 18	374A 15	375A 15	376A 17	378B 58	378A 16	379A 15	380A 18	381A 16	382A 15	383A 16	384A 15	385A 15	387A102	388A102	388A 15	389A 15
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	373A 16	374A 13	375A 13	376A 15	377A 13	378A 14	379A 13	380A 16	381A 14	382A 13	383A 14	384A 13	385A 13	386A 13	387A 13	388A 13	389A 13
A.11g	Solar X-ray (SMS/GOES)	373A 25	374A 20	375A 18	376A 21	377A 19	378A 20	379A 19	380A 26	381A 21	382A 18	383A 19	384A 17	385A 18	386A 16	387A 18	388A 19	389A 18
A.11h	Solar X-ray (OSO-8; 1975-057A)	374A 28	375A 24	376A 28	377A 26	378A 28	379A 26	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	389A 26	
A.11th	Solar EUV Spectroheliograms FeXV 284Å (AURA O2-B)	---	---	---	---	---	---	380A 36	381A 30	382A 26	383A 26	384A 24	385A 26	386A 22	387A 26	388A 26	209A 26	
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	---	374A 18	---	---	377A 18	---	---	---	---	---	---	---	---	386A 15	387A 16	388A 18	---
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	---	374A 19	---	---	---	---	---	---	---	---	---	---	---	---	387A 17	---	---
A.12a	Energetic Solar Particles (IMP H & J)	380B 23	381B 29	382B 29	382B 35	382B 12	383B 17	384B 10	385B 16	386B 20	387B 16	388B 15	389B 12	---	---	---	---	---
A.13a	Solar Wind (Pioneers 6 & 7)	---	374A 18	---	---	377A 18	378A 19	379A 18	---	---	---	---	---	---	386A 15	387A 16	388A 18	---
A.13d	Solar Wind from IPS Measurements	373A 24	374A 17	375A 17	376A 20	377A 17	378A 18	380A123	380A 25	381A 20	382A 17	383A 18	---	---	---	387A 15	388A 17	389A 17
A.13e	Solar Plasma (IMP H & J)	380B 22	381B 38	382B 28	382B 34	383B 39	383B 16	384B 9	385B 15	387B 36	387B 15	388B 14	389B 11	---	---	---	---	---
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	374A 18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
A.17	Interplanetary Magnetic Field (Pioneer 9)	---	374A 19	---	---	---	---	---	---	---	---	---	---	---	---	387A 17	---	---
A.17c	Inferred IP Magnetic Field	373A 29	374A 23	375A 20	376A 24	377A 21	378A 24	379A 22	380A 31	381A 25	382A 22	383A 22	384A 20	385A 22	386A 18	387A 21	388A 22	389A 22
A.18	Interplanetary Electric Field (Pioneer 8)	---	374A 19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
A.18	Interplanetary Electric Field (Pioneer 9)	---	374A 19	---	---	---	---	---	---	---	---	---	---	---	---	387A 17	---	---
B.	**Ionospheric (and Radio Wave Propagation) Phenomena**																	
B.51ca	High Latitude Quality Figures and Forecasts	374A115	375A103	376A113	377A111	378A114	379A115	380A119	381A126	382A113	383A118	384A108	385A113	386A111	387A115	---	---	
B.52	Graphs of Transmission Frequency Range	374A116	375A104	376A114	377A112	378A115	379A116	380A120	381A127	382A114	383A120	384A110	385A114	386A112	387A116	388A116	389A110	
B.53	Quality Figures Based on Frequency Ranges	374A118	375A106	376A116	377A114	378A117	379A118	380A122	381A129	382A116	383A119	384A109	385A116	386A114	387A118	388A118	389A109	
C.	**Flare-Associated Events**																	
C.1a	Optical Observations Flares	373A 10	374A 20	375A 10	376A 10	377A 10	378A 10	379A 10	380A 10	381A 10	382A 10	383A 10	384A 10	385A 10	386A 10	387A 10	388A 10	389A 10
C.1ba	Optical Observations Flares (Standardized Data)	378B 4	379B 4	380B 4	381B 4	382B 4	383B 4	384B 4	385B 4	386B 7	387B 6	388B 6	389B 6					
C.1d	Flare Patrol Observations	373A 14	374A 11	375A 11	376A 13	377A 11	378A 12	379A 11	380A 14	381A 12	382A 11	383A 12	384A 11	385A 11	386A 11	387A 11	388A 11	389A 11
C.1d	Flare Patrol Observations	378B 25	379B 8	380B 7	381B 13	382B 8	383B 10	384B 7	385B 14	386B 12	387B 10	388B 11	389B 9					
C.1e	Flare Indices (by day)	378B 24	379B 7	380B 6	381B 12	382B 7	383B 9	384B 6	385B 13	386B 11	387B 9	388B 10	389B 8					
C.1f	Flare Indices (by Region)	379B 12	380B 20	381B 36	382B 26	383B 32	384B 24	385B 56	386B 34	387B 30	388B 30	389B 26						
C.3	Solar Radio Waves - Outstanding Occurrences	378B 26	379B 9	380B 8	381B 14	382B 9	383B 11	384B 8	385B 15	386B 13	387B 11	388B 12	389B 10					
	Solar Radio Waves - Fixed Frequencies - Selected	373A 19	374A 16	375A 16	376A 18	377A 16	378A 17	379A 16	380A 19	381A 17	382A 16	383A 17	384A 16	385A 16	386A 14	387A 14	388A 16	389A
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	374A107	375B 26	376A105	377A102	378A101	379A102	380A106	381A114	382B 37	383A103	385B 60	385A100					
C.4a	Solar Radio Spectral Obs. (Fort Davis)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	380A102	381A100	382A 93	383A 96	384A 92	385A 95	386A 91	387A 95	388A 96	389A 92	
C.4b	Solar Radio Spectral Obs. (Boulder)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	380A102	381A100	382A 93	383A 96	384A 92	---	---	---	---	---	---
C.4d	Solar Radio Spectral Obs. (Culgoora)	378B 54	376B 24	376A 98	377A 94	378A 96	379A 95	380A102	381A100	382B 34	383A 96	385B 58	385A 95	387B 32	389B 29	389B 32	389A 92	
C.4e	Solar Radio Spectral Obs. (Weissenau)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	380A102	381A100	382A 93	383A 96	384A 92	385A 95	386A 91	387A 95	388A 96	389A 92	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	381B 45	381A100	382A 93	383A 96	384A 92	385A 95	386A 91	387A 95	388A 96	389A 92	
C.4h	Solar Radio Spectral Obs. (Dwingeloo)	---	---	376A 98	---	---	379A 95	---	381A100	382A 93	383A 96	384A 92	---	386A 91	387A 95	388A 96	389A 92	
C.4i	Solar Radio Spectral Obs. (Nançay)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	380A102	381A100	382A 93	383A 96	384A 92	385A 95	386A 91	387A 95	388A 96	389A 92	
C.4j	Solar Radio Spectral Obs. (Manila)	374A 99	375A 92	376A 98	377A 94	378A 96	379A 95	381B 45	381A100	382A 93	383A 96	384A 92	385A 95	386A 91	387A 95	388A 96	389A 92	
C.5a	Solar X-ray (SMS/GOES)	373A 27	374A 22	375A 18	376A 23	377A 23	378A 22	---	380A 28	381A 23	382A 20	---	---	---	385A 20	---	---	389A 20
C.6	Sudden Ionospheric Disturbances	374A 96	375A 91	376A 97	377A 93	378A 95	379A 94	380A101	381A 98	382A 92	383A 95	384A 91	385A 94	386A 90	387A 94	388A 95	389A 91	
D.	**Geomagnetic and Magnetospheric Phenomena**																	
D.1a	Geomagnetic Indices Kp, Kn, Ks, Km, Ap, aa, Cp	374A110	374A 98	376A108	377A105	378A105	379A108	380A112	381A119	382A106	383A111	385B 61	385A106	386A104	387A108	388A108	389A102	
D.1ba	27-day Chart of Kp Indices	374A111	374A 99	376A109	377A106	378A107	379A109	380A114	381A121	382A108	383A113	384A103	385A108	386A106	387A110	388A110	389A104	
D.1c	27-Day Chart of C9	378A108	378A108	376A108	378A108	378A108												
D.1d	Principal Magnetic Storms	374A113	374A101	376A111	377A108	378A112	379A113	380A117	381A124	382A111	383A116	384A106	385A111	386A109	387A113	388A113	389A107	
D.3a	Reduced Magnetograms	---	---	381B 47	382B 40	---	---	---	---	---	---	---	---	---	---	---	---	
D.1f	Sudden Commencement and Solar Flare Effects	374A114	374A102	376A112	377A110	378A113	379A114	380A118	381A125	382A112	383A117	384A107	385A112	386A110	387A114	388A114	389A108	
D.1g	Equatorial Indices Dst	374A112	374A100	376A110	377A107	378A111	379A112	380A116	381A123	382A110	383A115	384A105	385A110	386A108	387A112	388A112	389A106	
F.	**Cosmic Rays**																	
F.1a	Cosmic Ray Neutron Counts (Deep River)	374A108	375A 96	377B 34	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1b	Cosmic Ray Neutron Counts (Climax)	374A108	375A 96	376A106	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1e	Cosmic Ray Neutron Counts (Alert)	374A108	375A 96	377B 34	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1f	Cosmic Ray Neutron Counts (Calgary)	374A108	375A 96	376A106	377A103	378A104	380B 28	381B 44	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)	374A108	375A 96	376A106	377A103	378A104	380B 28	381B 44	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1h	Cosmic Ray Neutron Counts (Thule)	374A108	375A 96	376A106	377A103	378A104	379A103	380A107	381A118	383B 38	383A104	---	---	---	---	---	---	
F.1i	Cosmic Ray Neutron Counts (Kiel)	374A108	375A 96	376A106	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
F.1j	Cosmic Ray Neutron Counts (Tokyo)	374A108	375A 96	376A106	377A103	378A104	379A103	380A107	381A118	382A101	383A104	384A 96	385A101	386A 99	387A103	388A103	389A 97	
H.	**Miscellaneous**																	
H.60	IUWDS Alert Decisions	373A 4	374A 4	375A 5	376A 5	377A 5	378A 5	379A 5	380A 4	381A 4	382A 4	383A 5	384A 5	385A 5	386A 5	387A 4	388A 5	389A 4
H.62	Abbreviated Calendar Record	379B 15	380B 13	381B 29	382B 19	383B 25	384B 17	385B 49	386B 27	387B 23	388B 23	389B 19						

Note: A = Part I, B = Part II.

374A 28 listed under 1975 Aug shows that data for August 1975 were contained in *Solar-Geophysical Data* Number 374 - Part 1 beginning on page 28.

JULY 1976 DATA

Contents

	Page
Active Regions	4
Synoptic Solar Map	5
Solar Flares	
Hα Solar Flares (Standardized Data)	6-7
Daily Flare Indices	8
No-Flare-Patrol Chart	9
Solar Radio Waves	
Worldwide Outstanding Occurrences at Fixed Frequencies	10
Energetic Solar Particles and Plasma	11-16
Magnetograms of Geomagnetic Storm (None produced for July 1976)	

ACTIVE REGIONS

CARRINGTON ROTATION 1643

(June 23-July 21, 1976)

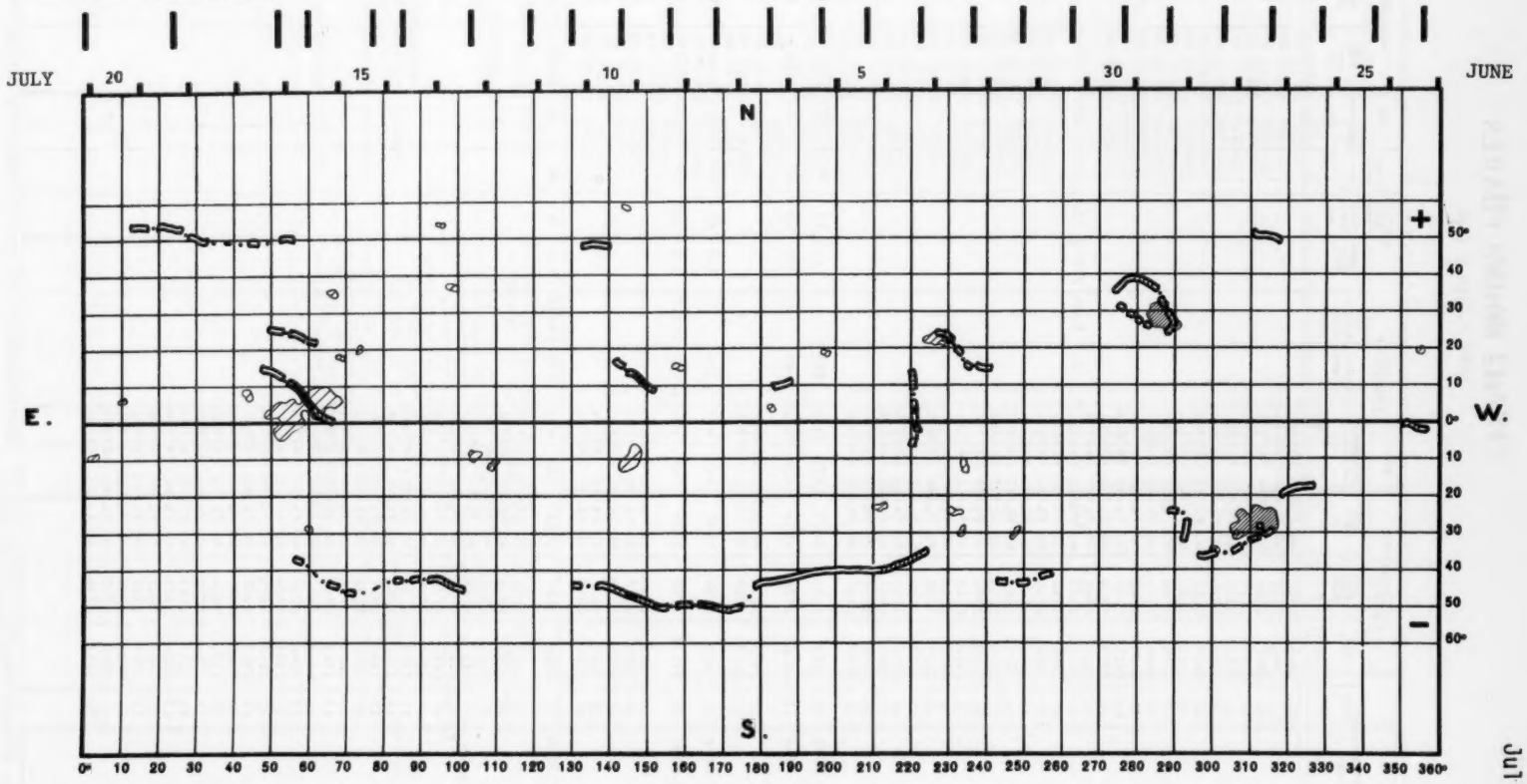
Region No.	Coordinates Lat.	Long.	Age at CMP	Imp.	Spot-less Region	Region No. in Rotation 1640	Activity at West Limb
1	20°N	355°	+4	1	x		disappeared
2	27 S	312	>6	2			decreasing
3	34 S	301	-1	1	x		disappeared
4	29 N	287	>6	1	x		decreasing
5	29 S	248	-4	1	x		decreasing
6	11 S	234	-5	1	x		?
7	24 S	232	+5	1	x		dispersed
8	23 N	228	+1	2			decreasing, without spot at the limb
9	23 S	212	+2	1	x		disappeared
10	16 N	158	-4	1	x		stable
11	59 N	144	-3	1	x		disappeared
12	8 S	104	-2	1	x		decreasing
13	4 N	58	>6	1	x	(12-13)	dispersed

SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1643

JUNE 23 TO JULY 21, 1976

MEUDON OBSERVATORY



5 Jul 76

Hα SOLAR FLARES

JULY 1976

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JUL	START	MAX. PHASE	END	APPROX LAT.	APPROX HEE DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONG.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	01	1546	1937	NO FLARE PATROL													
	01	1948	2032	NO FLARE PATROL													
	02	2057	2108	NO FLARE PATROL													
	02	2109	2120	NO FLARE PATROL													
	02	2138	2322	NO FLARE PATROL													
	02	2345	2355	NO FLARE PATROL													
	03	0009	0110	NO FLARE PATROL													
	03	0112	0131	NO FLARE PATROL													
	03	1734	1740	NO FLARE PATROL													
	03	1842	1858	NO FLARE PATROL													
	03	2049	2102	NO FLARE PATROL													
	04	2111	2130	NO FLARE PATROL													
	04	2303	2310	NO FLARE PATROL													
	06	1835	2040	NO FLARE PATROL													
	06	2339	2343	NO FLARE PATROL													
	07	0251	0255	NO FLARE PATROL													
	07	1850	1911	NO FLARE PATROL													
	08	2113	2225	NO FLARE PATROL													
	09	1939	1947	NO FLARE PATROL													
	09	1951	2013	NO FLARE PATROL													
	09	2049	2236	NO FLARE PATROL													
	10	0113	0119	NO FLARE PATROL													
	10	1812	2000	NO FLARE PATROL													
	10	2040	2200	NO FLARE PATROL													
	11	0139	0140	NO FLARE PATROL													
	11	2110	2201	NO FLARE PATROL													
	12	1957	2153	NO FLARE PATROL													
	12	2218	0050	NO FLARE PATROL													
	13	0100	0107	NO FLARE PATROL													
493 HTPR	13	1239	1251	1317	N26	W80	.982		7.5	38	-F		C	1251	10		
494 HTPR	13	1326	1330	1339	N26	W80	.982		7.6	13	-F		C	1330	10		
	13	1922	2135	NO FLARE PATROL													
	13	2143	2205	NO FLARE PATROL													
495 HTPR	14	1520	1536	1540	N14	W65	.904		9.8	20	-F		C	1536	20		
496 MONT	15	0722E	0722	0734	N07	W90	1.000	14328	8.6	120	-F		C	0722	20		
	15	1928	1938	NO FLARE PATROL													
	15	2005	2017	NO FLARE PATROL													
	16	0029	0039	NO FLARE PATROL													
	16	0056	0157	NO FLARE PATROL													
	16	0201	0218	NO FLARE PATROL													
497 HTPR	16	0534	0627	0648	N38	W36	.731	14330	13.5	74	-F		C	0627	20	.2	E
	17	1839	1846	NO FLARE PATROL													
	17	1951	1910	NO FLARE PATROL													
	17	1921	1931	NO FLARE PATROL													
	17	2103	2116	NO FLARE PATROL													
	17	2125	2147	NO FLARE PATROL													
	17	2213	2230	NO FLARE PATROL													
	17	2243	2245	NO FLARE PATROL													
	17	2318	2332	NO FLARE PATROL													
	18	1152	1224	NO FLARE PATROL													
	18	1847	1910	NO FLARE PATROL													
	19	1120	1150	NO FLARE PATROL													
	19	1651	1702	NO FLARE PATROL													
	19	1713	1753	NO FLARE PATROL													
	19	1940	2007	NO FLARE PATROL													
	19	2240	2258	NO FLARE PATROL													
	19	2311	2334	NO FLARE PATROL													
	20	0148	0328	NO FLARE PATROL													
	20	0919	0920	NO FLARE PATROL													
	20	0925	0926	NO FLARE PATROL													
	20	1234	1316	NO FLARE PATROL													
	20	1319	1320	NO FLARE PATROL													
	20	2037	2109	NO FLARE PATROL													
	20	2320	2326	NO FLARE PATROL													
	20	2400	0017	NO FLARE PATROL													
	21	1734	2300	NO FLARE PATROL													
	22	0020	0025	NO FLARE PATROL													
	22	0046	0052	NO FLARE PATROL													
	22	0157	0230	NO FLARE PATROL													

Note: Although these flare listings give all reported events, not all possible brightenings are reported. Thresholds of reporting vary from observatory to observatory.

Hα SOLAR FLARES

JULY 1976

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JUL	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Millionths of Disk	CORR AREA Sq. Deg.	
	22	0232	0246	NO FLARE PATROL													
	22	1604	1758	NO FLARE PATROL													
	22	1810	1819	NO FLARE PATROL													
	22	2100	2119	NO FLARE PATROL													
	22	2145	2328	NO FLARE PATROL													
	22	2337	2342	NO FLARE PATROL													
	22	2358	0001	NO FLARE PATROL													
	23	0003	0016	NO FLARE PATROL													
	23	1931	1941	NO FLARE PATROL													
	23	2240	2316	NO FLARE PATROL													
	23	2325	0138	NO FLARE PATROL													
	24	0158	0300	NO FLARE PATROL													
	24	0315	0321	NO FLARE PATROL													
498 HTPR	24	1257	1258	1303	S30	E23	.662	14333	26.3	6	-F		C	1258	10	.1	0
	24	2059	2119	NO FLARE PATROL													
	24	2233	2256	NO FLARE PATROL													
	24	2317	2346	NO FLARE PATROL													
	25	1714	1845	NO FLARE PATROL													
	25	1856	0013	NO FLARE PATROL													
	26	0016	0206	NO FLARE PATROL													
	26	2042	2129	NO FLARE PATROL													
	27	1949	2003	NO FLARE PATROL													
	28	2013	2030	NO FLARE PATROL													
	29	2007	2018	NO FLARE PATROL													
	29	2022	2031	NO FLARE PATROL													
	29	2043	2053	NO FLARE PATROL													
	29	2109	2126	NO FLARE PATROL													
	29	2144	2250	NO FLARE PATROL													
	29	2328	0000	NO FLARE PATROL													
	30	0043	0103	NO FLARE PATROL													
	30	0105	0122	NO FLARE PATROL													
	30	0130	0141	NO FLARE PATROL													
	30	0146	0153	NO FLARE PATROL													
	30	0219	0225	NO FLARE PATROL													
	30	2116	2117	NO FLARE PATROL													
	30	2158	2208	NO FLARE PATROL													
	30	2242	2247	NO FLARE PATROL													
	30	2315	2343	NO FLARE PATROL													
	30	2351	0001	NO FLARE PATROL													
	31	0016	0024	NO FLARE PATROL													
	31	0027	0039	NO FLARE PATROL													
	31	0126	0143	NO FLARE PATROL													
	31	0145	0158	NO FLARE PATROL													
	31	2042	2058	NO FLARE PATROL													

"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

DAILY FLARE INDICES
Includes all Flares

JULY 1976

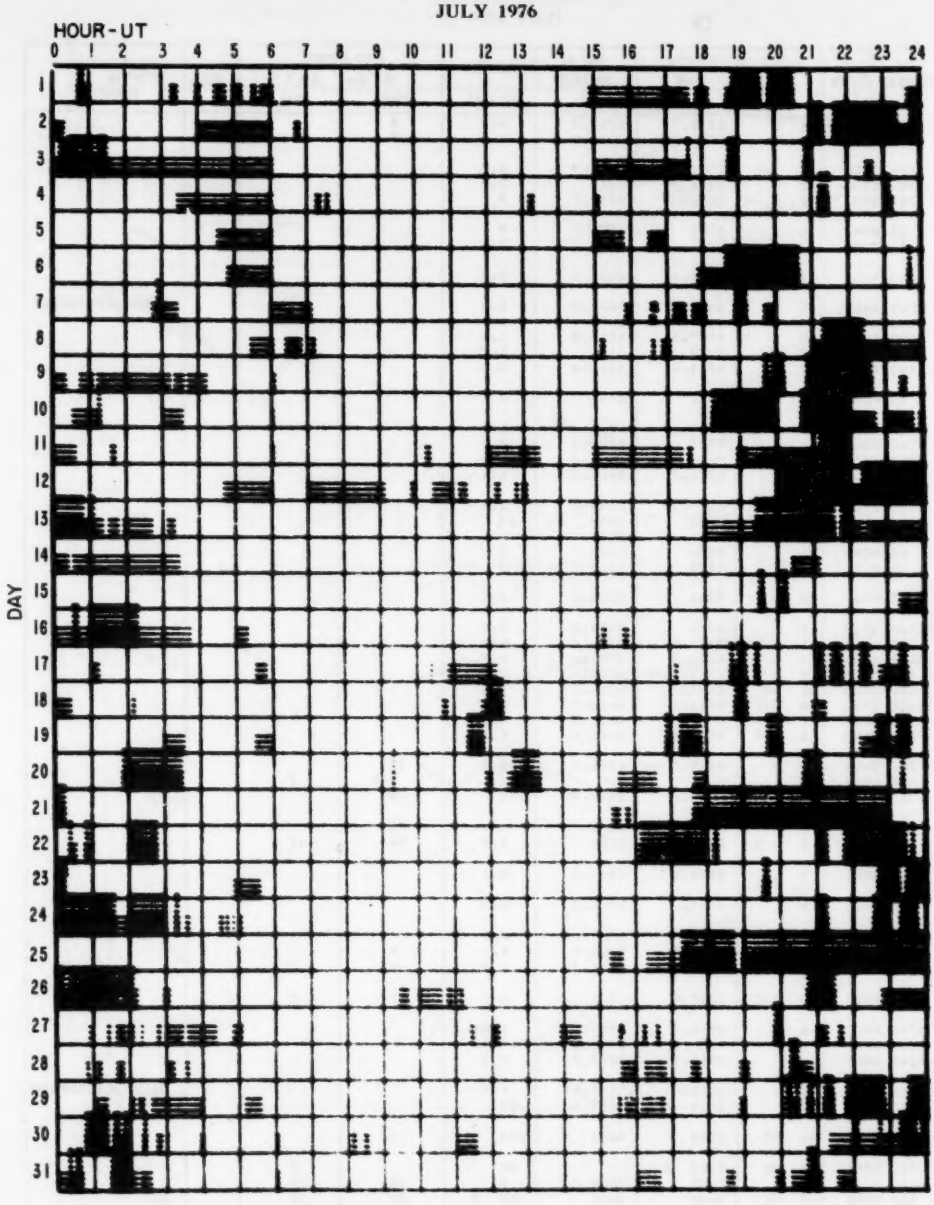
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
760701	0.00	22.4	760712	0.00	19.5	760722	0.00	18.8
760702	0.00	21.7	760713	1.81	21.3	760723	0.00	20.8
760703	0.00	22.1	760714	.84	24.0	760724	2.06	21.7
760704	0.00	23.6	760715	.84	23.6	760725	0.00	17.2
760706	0.00	21.9	760716	1.90	22.5	760726	0.00	21.4
760707	0.00	23.6	760717	0.00	22.3	760727	0.00	23.8
760708	0.00	22.8	760718	0.00	23.1	760728	0.00	23.7
760709	0.00	21.7	760719	0.00	21.5	760729	0.00	21.6
760710	0.00	20.8	760720	0.00	20.7	760730	0.00	22.1
760711	0.00	23.1	760721	0.00	18.6	760731	0.00	22.9

When no Flare Index is given, it is 0 for that day.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

JULY 1976



Observatories included in total patrol:

Athenes	Huancayo	Kodaikanal	Mitaka	Tehran
Bucharest	Hurbanovo	Locarno	Monte Mario	Upice
Catania	Istanboul	Lvov	Palehua	Voroshilov
Haute Provence	Kharkov	Manila	Ramey	Wendelstein
Herstmonceux	Kiev	McMath-Hulbert	Tachkent	Zürich

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

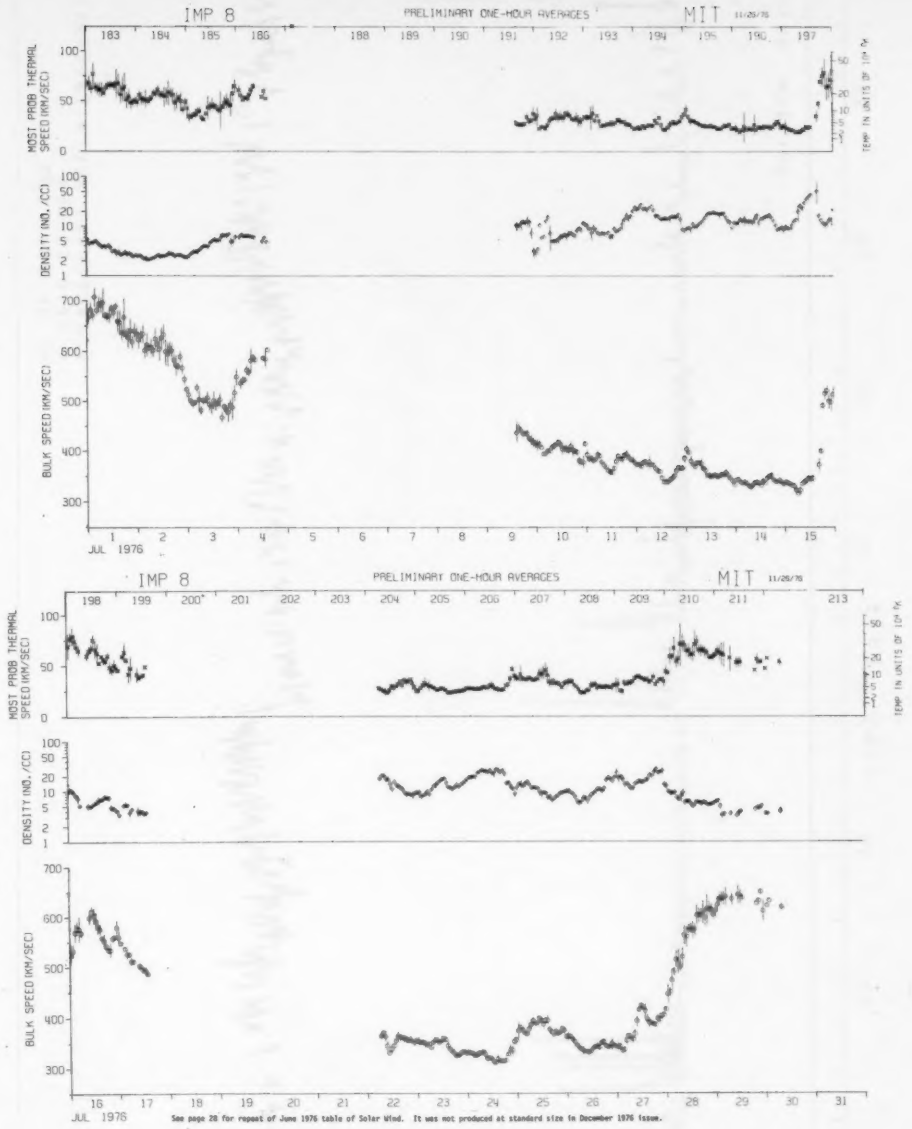
SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JULY 1976

JUL 1976	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
1	260	ONDR	8 S	1210.7	1210.7	0.3	8			
	260	ONDR	9 S	1356.5	1356.5	0.2	17			
2	700	SYDN	2 S/F	0040.3	0040.5	0.7				
	700	SYDN	40 F	0116.2	0117	2.2				
	700	SYDN	40 F	0132.6	0139.5	8				
4	18	MCMA	6	1756	1758	5			1	
	18	MCMA	6	1947	1949	2			1	
7	9240	ARCE	3	0900.4	0900.5	0.7				
9	9240	ARCE	1	0823.7	0823.8	0.5				RECORD DISTURBED
	9240	ARCE	2	1104.7	1104.9	0.7				
	9240	ARCE	2	1117.9	1118.2	1.4				
	9240	ARCE	2	1119.9	1121	1.7				
	9240	ARCE	2	1211.6	1211.8	0.5				
10	18	MCMA	6	1732	1734	2			1	
12	700	SYDN	45 C	0016.1	0016.9	0.9				
	9240	ARCE	1	0802	0802.2	0.5				
	9240	ARCE	1	0828	0828.2	0.8				
	9240	ARCE	2	0841.2	0841.6	1.4				
14	700	SYDN	8 S	0044.3	0044.4	0.3				
	18	MCMA	42	2033	2039	13			1	
	18	MCMA	41	2048	2052	4			1	
	18	MCMA	6	2104	2106	2			1	
	18	MCMA	6	2108	2110	2			1	
15	700	SYDN	45 C	0330	0330.1	2.1				
16	700	SYDN	8 S	0324	0324.1	0.2				
	1400	SYDN	8 S	0324.1	0324.1	0.2				
	1400	SYDN	8 S	0326.5	0326.6	0.2				
	700	SYDN	8 S	0326.5	0326.6	0.2				
	700	SYDN	47 GB	0400.7	0400.7	0.1				
	1400	SYDN	4 S/F	0400.7	0400.7	0.3				
	1400	SYDN	4 S/F	0401.3	0401.3	0.3				
	700	SYDN	4 S/F	0401.3	0401.4	0.3				
18	260	ONDR	8 S	0825.7	0825.7	0.2	17			
	550	KIEV	41 F	1104		30.5	4.5	2.4		
	550	KIEV	42 SER	1134.7	1136.2	5	40			
19	2695	BOUL	8 S	2202	2203	1	35	13		
	4995	BOUL	8 S	2203	2204	1.5	54	17		
21	9240	ARCE	1	0934.4	0934.5	0.7				
22	9240	ARCE	4	1453.6	1453.9	0.6				
23	930	BORD	3 S	0707.7	0707.8	0.3	12	2		
	930	BORD	3	0951.3	0951.4	0.2	5			
	930	BORD	3 S	1501	1501.2	0.2	35	2		
26	260	ONDR	2 S/F	1322.5	1323	1.5	11	5		
27	9240	ARCE	46	0946.5	0946.6	1.1				
	9240	ARCE		0946.5	0946.6	0.4				
	9240	ARCE		0946.9	0947.2	0.7				
28	9240	ARCE	45	1212.3	1212.5	0.8				RECORD DISTURBED
	9240	ARCE	22	1415.8	1445.6	52				
30	287	VORO	44 NS	2100	0010	360	13			
31	200	GORK	44 NS	0303 E		40		5		
	200	HIRA	45 C	0405	0405.8	2	85	25		0
	200	HIRA	43 NS	0440	0623	300 D	30	10		WL
	221	ABST	44 NS	0500	0630	24	11			
	500	HIRA	27 RF	0530	0535	105	10	4		0
	200	GORK	44 NS	0503 E		117		20		
	100	HIRA	27 RF	0528	0557	45	12	6		0
	100	GORK	43 NS	0612		48		5		
	260	ONDR	43 NS	0618		542	31	4		
	127	TORN	44 NS	0730 E		450 D				
	200	HIRA	45 C	0738.2	0738.8	1.5	150	28		WL
	200	GORK	44 NS	0830 E		87		15		
	100	GORK	44 NS	0830		84		5		
	245	SGMR	43 NS	1757.7	2221.5	362.30	41.1			
	200	HIRA	44 NS	1940 E	0445	835 D	110	30		MLSL
	410	SGMR	6 S	1952	1952.6	3.2	12.3	3.7		
	287	VORO	44 NS	2100	2258	180	47			

IMP 7 AND 8 SOLAR WIND PLASMA

JULY 1976

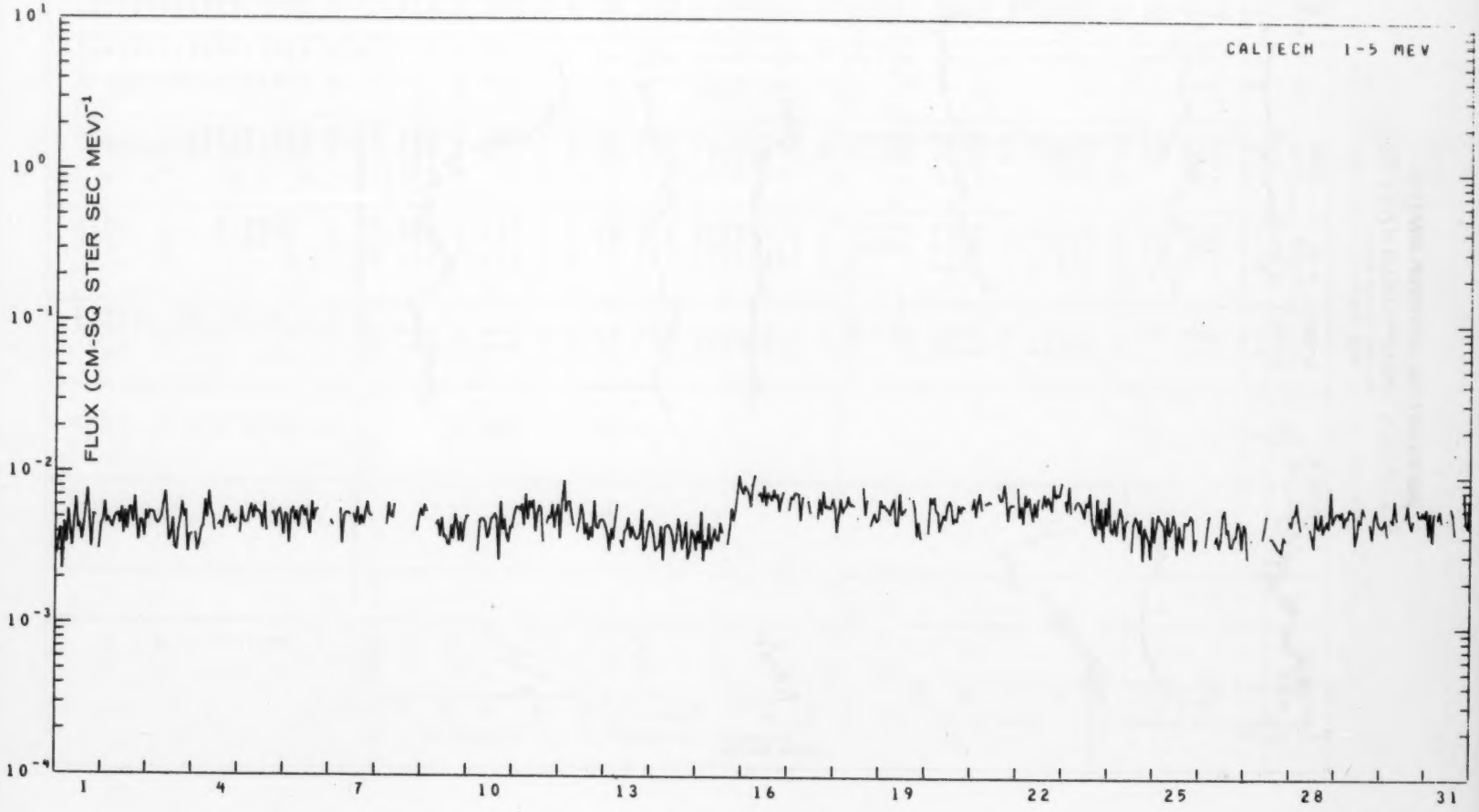


See page 28 for repeat of June 1976 table of Solar Wind. It was not produced at standard size in December 1976 issue.

IMP 7 AND 8 ELECTRONS

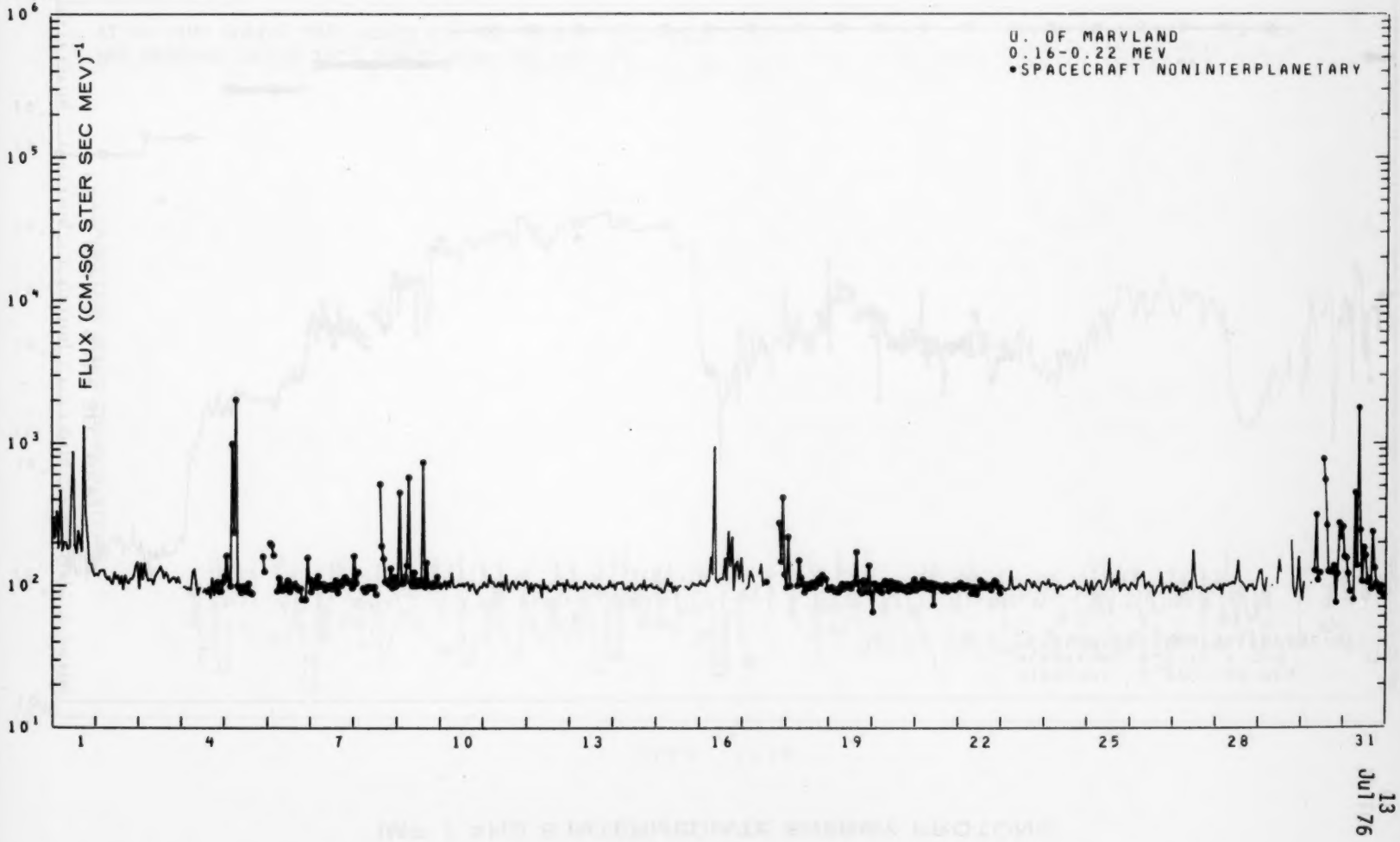
JULY 1976

12 Jul 76



IMP 7 AND 8 LOW ENERGY PROTONS

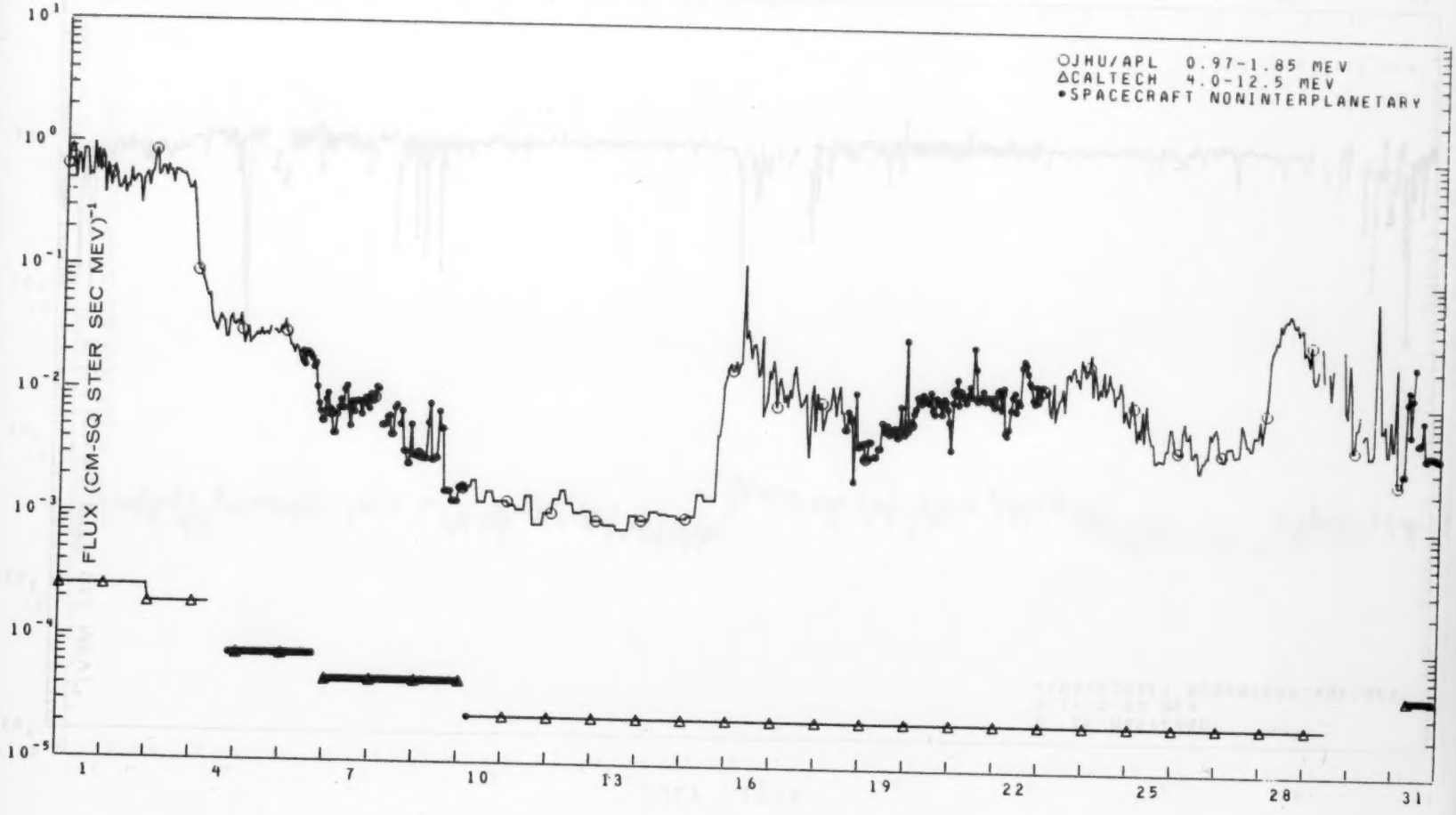
JULY 1976



IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

JULY 1976

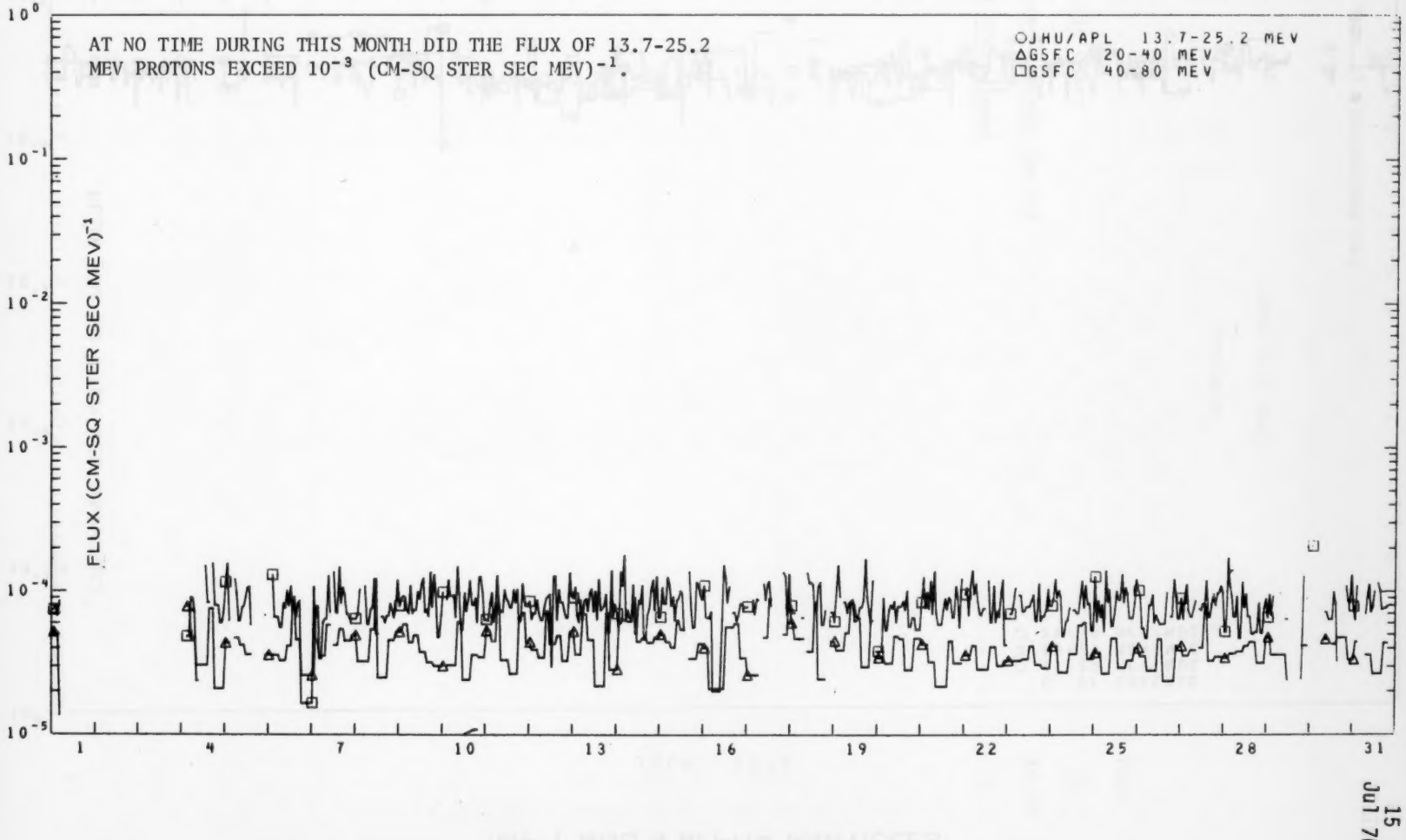
14 Jul 76



IMP 7 AND 8 HIGH ENERGY PROTONS

IMP 7 AND 8 HIGH ENERGY PROTONS

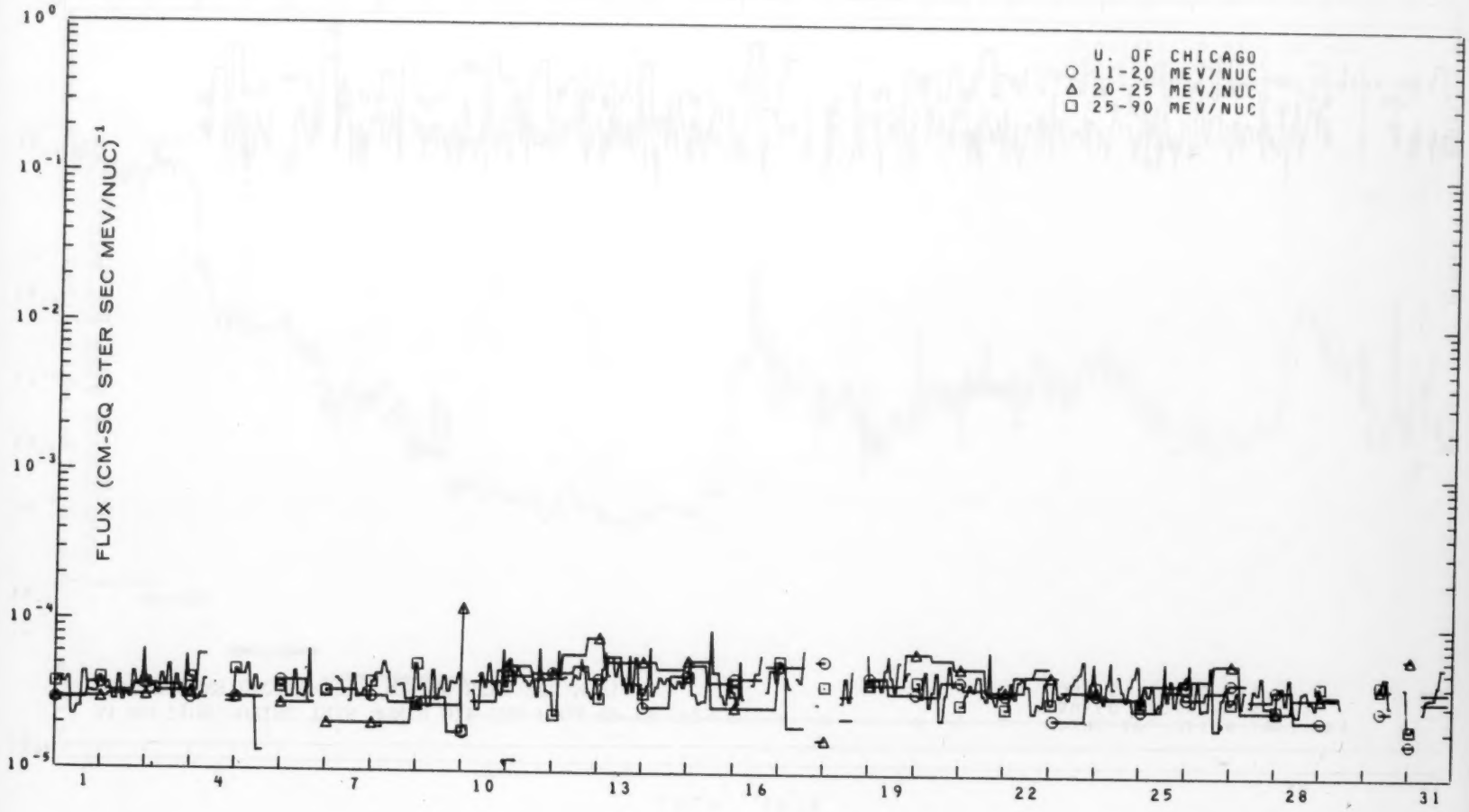
JULY 1976



IMP 7 AND 8 ALPHA PARTICLES

JULY 1976

16 Jul 76



JUNE 1976 DATA

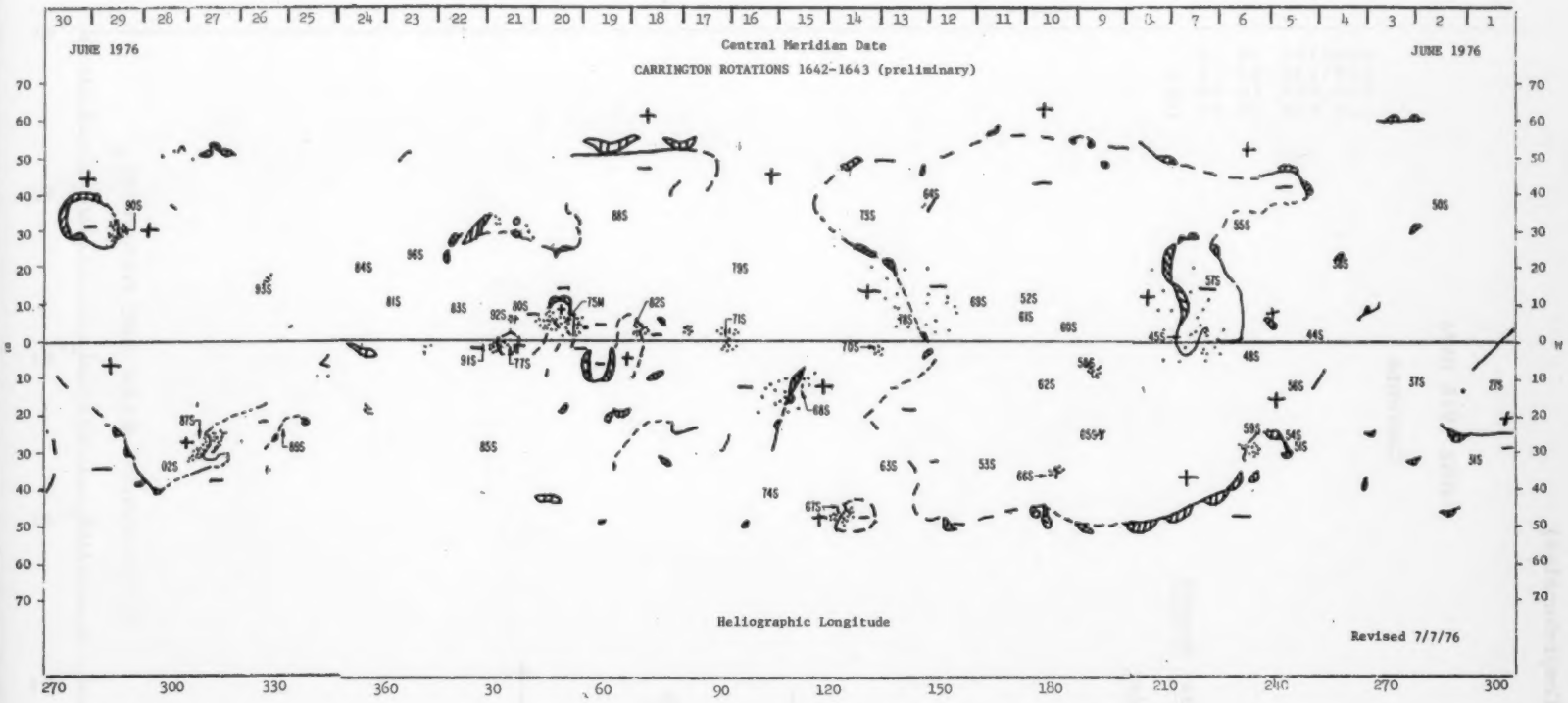
Contents

	Page
Hα Synoptic Chart	18
Abbreviated Calendar Record	19-26
Regional Flare Index	26

ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

JUNE 1976



ABBREVIATED CALENDAR RECORD

June 1, 1976 — 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 6	Kp	1- | 1o | 2- | 1+ | 2- | 1+ | 3- | 2+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data 325°-355° SW-
Indices		Rz: 0 10cm flux: 66 Flare: 0/22.2 Ca: 0.5 Ip: 0 Ia: 0
Solar Regions		(14249) N06 CMP MAY 31.7 (14247) S12 (14231) S32
Sunspots		

June 2, 1976 — 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	|
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 6	Kp	2- | 2o | 2+ | 2- | 1+ | 2+ | 2- | 1o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW-
Indices		Rz: 0 10cm flux: 66 Flare: 0/21.2 Ca: 0.3 Ip: 0 Ia: 0
Solar Regions		(14250) N37 (14237) S11
Sunspots		

June 3, 1976 — 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 12	Kp	2- | 2- | 1- | 1+ | 2- | 2o | 5- | 4-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 66 Flare: 0/22.7 Ca: 0.7 Ip: 0 Ia: 0
Solar Regions		
Sunspots		

June 4, 1976 — 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 200	Kp	4o | 5+ | 3- | 3o | 4- | 2- | 2o | 3-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 66 Flare: 0/23.9 Ca: 0.7 Ip: 0 Ia: 3
Solar Regions		(14238) N21
Sunspots		

June 5, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 200 — Kp: 3- 4- 3+ 4o 4+ 3o 3- 3+ — sc:

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data

Indices — Rz: 0 10cm flux: 67 Flare: 0/23.6 Ca: 0.4 Ip: 0 Ia: 3

Solar Regions — (14244) N01 (14251) S28 (14254) S25 (14256) S11

Sunspots

June 6, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 7 — Kp: 2o 2o 2+ 2o 2o 2o 2- 2+ — sc:

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data 0°, 40° SE no data 180° W. Limb 7 days later: NW-no data 290°-355° SW-

Indices — Rz: 0 10cm flux: 67 Flare: 0/21.4 Ca: 1.3 Ip: 0 Ia: 0

Solar Regions — (14259) S24 14255 N31 (14248) S03

Sunspots — (19694) S25 (βp)3

June 7, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 13 — Kp: 3- 3- 3+ 3- 3- 2+ 2- 4- — sc:

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-

Indices — Rz: 0 10cm flux: 67 Flare: 0/23.4 Ca: 1.5 Ip: 0 Ia: 2

Solar Regions — (14257) N17 14245 N01 (4)

Sunspots — (19693) S04 (αf)2

June 8, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 8 — Kp: 2+ 2+ 2+ 3o 1+ 2- 2+ 2- — sc:

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW-

Indices — Rz: 11 10cm flux: 69 Flare: 11/23.3 Ca: 3.6 Ip: 0 Ia: 2

Solar Regions

Sunspots

June 9, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 400	Kp	1o 2- 1+ 1o 0+ 0+ 1o 1-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona	E. Limb 7 days earlier: NE- no data	SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices	Rz: 10 10cm flux: 68	Flare: 2/23.4 Ca: 1.8 Ip: 0 Ia: 0
Solar Regions	14258 S06 (14265) S26	
Sunspots		

June 10, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 6	Kp	1- 1+ 1o 1+ 2- 1+ 1o 3-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona	E. Limb 7 days earlier: NE-	SE W. Limb 7 days later: NW- SW-
Indices	Rz: 7 10cm flux: 69	Flare: 2/23.0 Ca: 1.4 Ip: 0 Ia: 0
Solar Regions	(14260) N03 (14262) S12	14266 S36 (14252) N11 (14261) N06
Sunspots		

June 11, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 260	Kp	4+ 5+ 4o 4- 5- 3o 3- 2+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona	E. Limb 7 days earlier: NE-	SE- W. Limb 7 days later: NW- SW- no data 185°
Indices	Rz: 7 10cm flux: 69	Flare: 2/23.4 Ca: 1.7 Ip: 0 Ia: 4
Solar Regions	(14253) S33 (14269) N10	
Sunspots		

June 12, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 7	Kp	1+ 1+ 1+ 3- 2+ 3- 2- 1o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona	E. Limb 7 days earlier: NE- no data	SE no data W. Limb 7 days later: NW- no data SW- no data
Indices	Rz: 8 10cm flux: 70	Flare: 3/23.0 Ca: 2.7 Ip: 0 Ia: 2
Solar Regions	(14264) N39	
Sunspots		

June 13, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 40 — Kp: 1o | 2- | 2+ | 0+ | 1+ | 0+ | 0+ | 1+

sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data; SE- no data; W. Limb 7 days later: NW- no data; SW- no data

Indices — Rz: 8; 10cm flux: 70; Flare: 0/20.7; Ca: 2.8; Ip: 0; Ia: 3

Solar Regions — (14278) N05; (14263) S34

Sunspots

June 14, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 30 — Kp: 1o | 1+ | 0+ | 0+ | 0+ | 0+ | 1- | 1-

sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data; SE no data; W. Limb 7 days later: NW- no data; SW- no data

Indices — Rz: 15; 10cm flux: 71; Flare: 1/22.7; Ca: 2.5; Ip: 0; Ia: 0

Solar Regions — (14270) S02; (14273) N33; 14267 S45

Sunspots — 19695 S46 (Bf)2

June 15, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 40 — Kp: 0+ | 0o | 0+ | 0o | 0+ | 1- | 2- | 3o

sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE-; SE-; W. Limb 7 days later: NW- no data; SW- no data

Indices — Rz: 18; 10cm flux: 72; Flare: 5/21.7; Ca: 3.7; Ip: 0; Ia: 0

Solar Regions — 14268 S14 (2)

Sunspots

June 16, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 50 — Kp: 2- | 2o | 1o | 2- | 0+ | 1- | 1o | 2-

sc

Aurora: USSR, W.E.

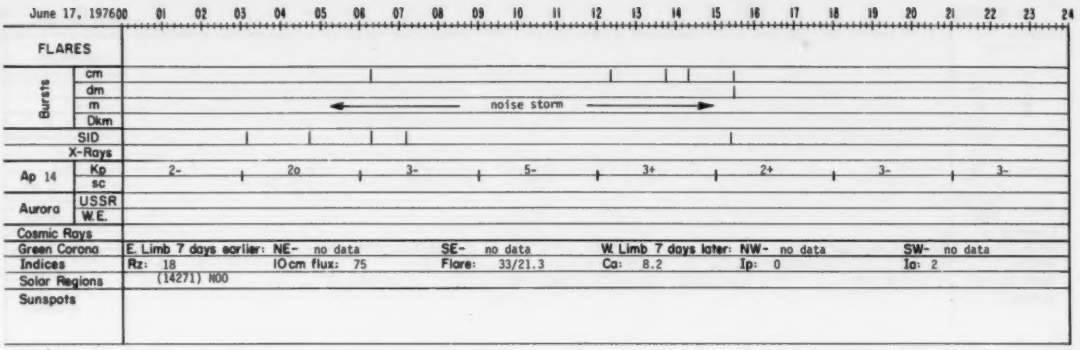
Cosmic Rays

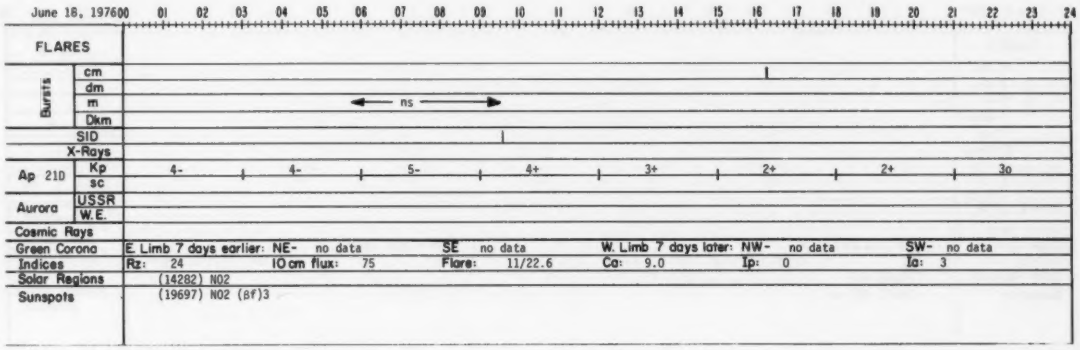
Green Corona — E. Limb 7 days earlier: NE-; SE; W. Limb 7 days later: NW- no data 335°,240°,350°; SW- no data 260°

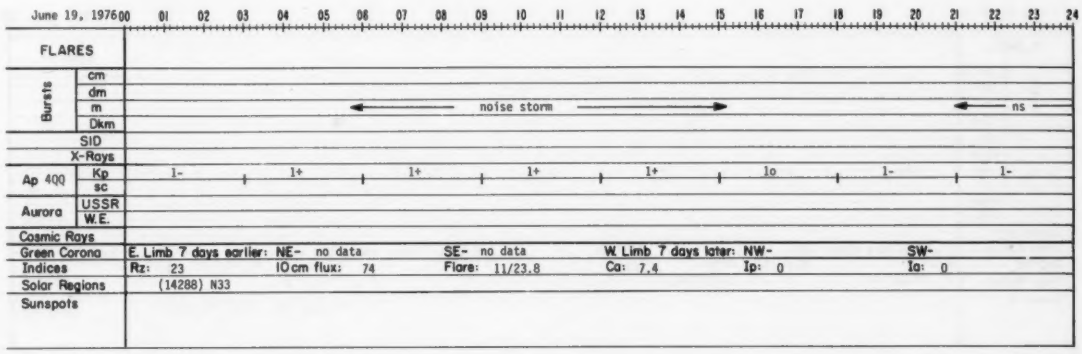
Indices — Rz: 12; 10cm flux: 75; Flare: 15/22.3; Ca: 4.7; Ip: 0; Ia: 0

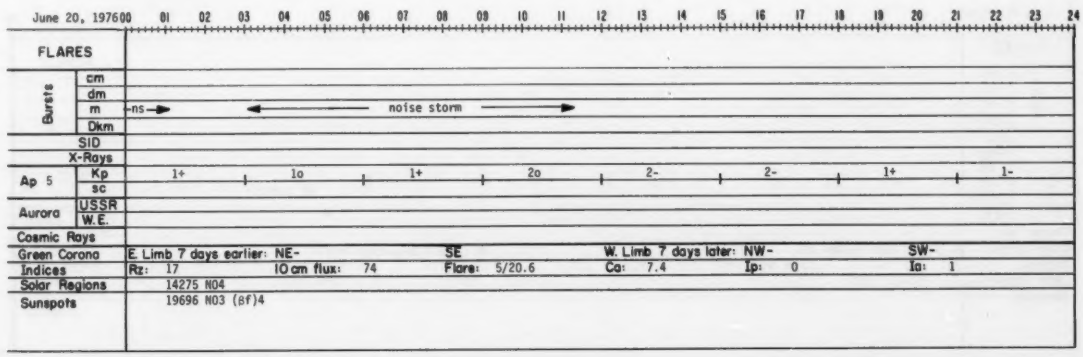
Solar Regions — (14274) S41; (14279) N19

Sunspots


June 17, 1976
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 14
Kp
sc
2- 2o 3- 5- 3+ 2+ 3- 3-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 18 10cm flux: 75 Flare: 33/21.3 Ca: 8.2 Ip: 0 Ia: 2
Solar Regions
(14271) N00
Sunspots


June 18, 1976
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
ns
SID
X-Rays
Ap 21
Kp
sc
4- 4- 5- 4+ 3+ 2+ 2+ 3o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 24 10cm flux: 75 Flare: 11/22.6 Ca: 9.0 Ip: 0 Ia: 3
Solar Regions
(14282) N02
Sunspots
(19697) N02 (Bf)3


June 19, 1976
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
ns
SID
X-Rays
Ap 40
Kp
sc
1- 1+ 1+ 1+ 1+ 1o 1- 1-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices
Rz: 23 10cm flux: 74 Flare: 11/23.8 Ca: 7.4 Ip: 0 Ia: 0
Solar Regions
(14288) N33
Sunspots


June 20, 1976
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
ns
noise storm
SID
X-Rays
Ap 5
Kp
sc
1+ 1o 1+ 2o 2- 2- 1+ 1-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW-
Indices
Rz: 17 10cm flux: 74 Flare: 5/20.6 Ca: 7.4 Ip: 0 Ia: 1
Solar Regions
14275 N04
Sunspots
19696 N03 (Bf)4

June 21, 197600 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 300	Kp	0+ 1- 1- 1- 1+ 1- 2- 0+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW- no data 190°, 225°
Indices		Rz: 30 10cm flux: 75 Flare: 6/22.4 Ca: 4.7 Ip: 0 Ia: 0
Solar Regions		(14280) N08 (14277) S01 (14292) N07 (14285) S29
Sunspots		

June 22, 197600 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 300	Kp	0+ 0+ 1o 1- 1+ 1- 1- 1-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data 270° SW-
Indices		Rz: 31 10cm flux: 76 Flare: 3/23.0 Ca: 7.2 Ip: 0 Ia: 0
Solar Regions		(14291) S01 (14283) N09
Sunspots		(19699) S01 (Bf)3

June 23, 197600 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	1
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 40	Kp	2o 1+ 1o 1o 1o 1- 1- 1o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 23 10cm flux: 74 Flare: 1/21.3 Ca: 7.9 Ip: 0 Ia: 0
Solar Regions		(14296) N24 (14281) N10
Sunspots		

June 24, 197600 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 16	Kp	1- 2- 1+ 1+ 1o 4- 5o 5-
	sc	▲1635(29)
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data 40° SE W. Limb 7 days later: NW- SW-
Indices		Rz: 26 10cm flux: 73 Flare: 0/17.2 Ca: 6.9 Ip: 0 Ia: 0
Solar Regions		(14284) N20
Sunspots		

June 25, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES								
Bursts	cm							
	dm							
	m							
	Dkm							
SID								
X-Rays								
Ap 18	Kp	4+	3o	4-	3-	3-	3+	3+	3-
	sc								
Aurora	USSR								
	W.E.								
Cosmic Rays									

Green Corona: E. Limb 7 days earlier: NE- no data 135° SE- W. Limb 7 days later: NW- no data 330° and 355° SW- no data 255°

Indices: Rz: 19 10 cm flux: 72 Flare: 2/20.9 Ca: 5.1 Ip: 0 Ia: 3

Solar Regions:

Sunspots:

June 26, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES								
Bursts	cm							
	dm							
	m							
	Dkm							
SID								
X-Rays								
Ap 7	Kp	2o	1o	1-	1o	1o	1o	3+	3-
	sc								
Aurora	USSR								
	W.E.								
Cosmic Rays									

Green Corona: E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data

Indices: Rz: 19 10 cm flux: 72 Flare: 1/21.8 Ca: 4.9 Ip: 0 Ia: 0

Solar Regions: (14289) S24 (14293) N14

Sunspots:

June 27, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES								
Bursts	cm							
	dm							
	m							
	Dkm							
SID								
X-Rays								
Ap 6	Kp	2o	2o	2+	1+	2o	1+	1+	1+
	sc								
Aurora	USSR								
	W.E.								
Cosmic Rays									

Green Corona: E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-

Indices: Rz: 9 10 cm flux: 70 Flare: 0/21.5 Ca: 4.7 Ip: 0 Ia: 0

Solar Regions: 14287 S27

Sunspots: 19698 S27 (αp)3 CMP June 28

June 28, 1976 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES								
Bursts	cm							
	dm							
	m							
	Dkm							
SID								
X-Rays								
Ap 5	Kp	2o	1o	2-	1-	1-	1+	2+	2-
	sc								
Aurora	USSR								
	W.E.								
Cosmic Rays									

Green Corona: E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-

Indices: Rz: 16 10 cm flux: 69 Flare: 0/21.5 Ca: 4.4 Ip: 0 Ia: 0

Solar Regions: (14302) S34

Sunspots:

June 29, 197600 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 50	Kp	1o 1+ 1+ 1+ 0+ 2o 2o 1-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices		Rz: 11 10cm flux: 69 Flare: 0/19.7 Ca: 4.5 Ip: 0 Ia: 0
Solar Regions		14290 N29
Sunspots		(19700) N29 Bp

June 30, 197600 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	I
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 29	Kp	2o 3- 4+ 7- 2+ 3o 4- 4-
	sc	▲ 0251(17)
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 10 10cm flux: 68 Flare: 0/22.8 Ca: 3.7 Ip: 0 Ia: 3
Solar Regions		
Sunspots		

REGIONAL FLARE INDEX
INCLUDES ALL FLARES

MC MATH PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
14237	S11	76/06/02.8	76/05/28	76/05/28	.95	.95	1
14259	S24	76/06/06.3	76/06/08	76/06/13	12.19	4.06	8
14262	S12	76/06/10.5	76/06/08	76/06/08	3.47	3.47	1
14267	S45	76/06/14.7	76/06/11	76/06/16	8.76	1.46	5
14282	N 2	76/06/18.8	76/06/20	76/06/22	7.18	2.39	2
14275	N 4	76/06/20.1	76/06/14	76/06/26	78.17	6.01	27
14291	S 1	76/06/22.1	76/06/25	76/06/25	2.10	2.10	1
14287	S27	76/06/27.7	76/06/22	76/06/23	2.16	1.35	4

Note:
Because of differences in method of calculation, the dates of Central Meridian Passage for the McMath Plage Regions vary somewhat from those given elsewhere. Any region not listed here produced no flares during its disk passage.

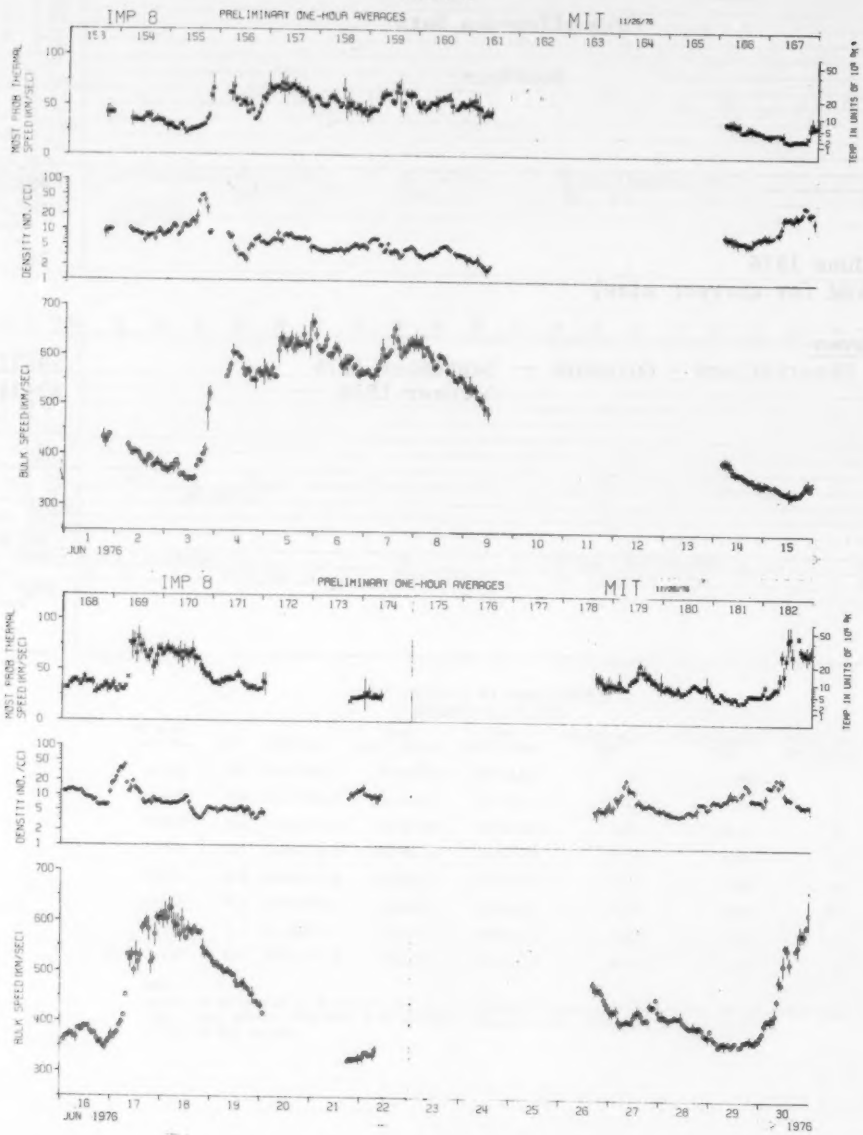
Miscellaneous Data

Contents

	Page
Solar Wind	
Imp 8 - June 1976 (repeated for correct size)	28
Solar Radio Waves	
Spectral Observations - Culgoora -- September 1976	29-31
October 1976	32-34

IMP 7 AND 8 SOLAR WIND PLASMA

JUNE 1976



SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

SEPTEMBER 1976

SEP 1976	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
01			CULG				0000	0417	1				IIIN
	0000	0417	CULG	0000	0417	1	0000	0417	1				IS
			CULG				2032	2400	1				IIIN
	2032	2400	CULG	2032	2400	1	2032	2400	1				IS
			CULG				2240.5	2247	2	2244	2247	1	IIIG,U
02	0000	0732	CULG	0000	0732	1	0000	0732	1				IS
			CULG				0000	0732	1				IIIN
			CULG				0554	0555	1				IIIG
			CULG				2032	2400	1				IIIS
	2032	2400	CULG	2032	2400	1	2032	2400	1				IS
03			CULG	0000	0731	1				0000	0731	1	IIIN,W
			CULG				0000	0731	1				IIIS
	0000	0731	CULG	0000	0731	1	0000	0731	1				IS
			CULG				0137		1	0137		1	IIIB
			CULG	0141	0142	1	0141	0142	1				IIIG
			CULG	0142.5	0146	1	0142.5	0146	2	0142.5	0146	1	IIIG,U
			CULG				0223.5	0225	2	0224	0225	2	IIIG
			CULG	0245.5	0246	1	0245.5	0246.5	2	0245.5	0246.5	2	IIIG,U
			CULG	0332.5	0333	1	0331	0333.5	1	0332	0333.5	1	IIIG
			CULG				0416.5		2	0416.5		2	IIIB
			CULG				2031	2400	1				IIIS
	2031	2400	CULG	2031	2400	1	2031	2400	1				IS
			CULG	2031	2400	1				2031	2400	1	IIIN
04	0000	0720	CULG	0000	0720	1	0000	0720	1				IS
			CULG	0000	0720	1				0000	0720	1	IIIN
			CULG				0000	0720	1				IIIS
			CULG				0035	0036	1	0035	0036	1	IIIG
			CULG	0214.5	0216	1	0214	0216	2	0215	0216	1	IIIGG
			CULG				0233	0234.5	1				IIIG
			CULG	0241	0244.5	1	0241	0244.5	2	0241	0244.5	2	IIIG,U
			CULG	0249	0249.5	1	0249	0249.5	1	0249	0249.5	1	IIIG
	2030	2400	CULG	2030	2400	1	2030	2400	1				IS
			CULG	2030	2400	1				2030	2400	1	IIIN
			CULG				2030	2400	1				IIIS
			CULG				2350	2352	2	2350	2352	2	IIIG,V
			CULG				2355	2356.5	1				IIIG
05			CULG				0000	0730	1				IIIS
	0000	0730	CULG	0000	0730	1	0000	0730	1				IS
			CULG	0000	0730	1				0000	0730	1	IIIN
			CULG				0111	0115	2	0112	0115	2	IIIGG
			CULG				0146	0147.5	2	0146	0147.5	1	IIIGG
	2050	2400	CULG	2050	2400	1	2050	2400	1				IS
			CULG	2050	2400	1				2050	2400	1	IIIN
			CULG				2050	2400	1				IIIS
06			CULG				0000	0350	1				IIIS
	0000	0350	CULG	0000	0350	1	0000	0350	1				IS
			CULG	0000	0350	1				0000	0350	1	IIIN
			CULG	0133	0137	1	0131	0138	2	0132.5	0137.5	2	IIIGG
			CULG				0135	0230					POS IV WEA
			CULG				0135	0147	1				II
			CULG				0155	0203	2	0155	0203	1	IIIGG
	0640	0730	CULG	0640	0730	1	0640	0730	1				IS
			CULG	0640	0730	1				0640	0730	1	IIIN
			CULG				0640	0730	1				IIIS
			CULG	2035	2400		2035	2400					IN,W
	2035	2400	CULG				2035	2400					IIIN,W
07			CULG	0000	0730		0000	0730					IN,W
	0000	0730	CULG				0000	0730					IIIN,W
			CULG				2030	2400					IIIN,W
	2030	2400	CULG	2030	2400		2030	2400					IN,W
			CULG				2134	2136	1				IIIGG
08	0000	0730	CULG				0000	0730	1				IIIN
			CULG	0000	0730		0000	0730					IN,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

SEPTEMBER 1976

SEP 1976	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
08			CULG				0355		1				IIIB,U
	2030	2400	CULG				2030	2100					IIIN,W
09	0000	0730	CULG				0000	0100					IIIN,W
			CULG				0713						IIIB,W
	2030	2400	CULG				2041						IIIB,W
			CULG				2103.5	2104					IIIG,W
			CULG				2225	2400					IS,W
10	0000	0729	CULG				0000	0729	1				IS
			CULG				0050	0729					IIIN,W
			CULG	0715	0729								IS,W
			CULG				2020	2400	1				IIIN
	2029	2400	CULG	2029	2400		2020	2400	1				IS
11	0000	0729	CULG	0000	0729		0000	0500					IS
			CULG				0000	0729					IIIS,W
			CULG				0500	0729	2				IS
			CULG				2029	2400	1				IIIN
	2029	2400	CULG	2029	2400		2029	2400					IN,W
12	0000	0648	CULG				0000	0648	1				IIIN
	2200	2400	CULG				2200	2400					IIIS,W
13	0000	0728	CULG				0000	0728	1				IIIS
			CULG				0225	0728	1				IS
	2028	2400	CULG				2028	2400					IIIN,W
14	0000	0727	CULG				0000	0727					IIIN,W
			CULG	0041	0042		0041	0042	2				IIIG,U
			CULG				0557	0600	1				IIIG,U
	2027	2400	CULG				2027	2315					IIIN,W
15	0000	0727	CULG				0108	0125					IIIN,W
	2028	2400	CULG										
16	0000	0727	CULG	0601	0605		0601	0605.5	2				IIIGG,U
			CULG				0607	0608.5	1				IIIG,U
	2026	2400	CULG				2216		1				IIIB,U
17	0000	0727	CULG				0132		1				IIIB
			CULG				0140	0143	1				IIIG
	2025	2400	CULG										
18	0000	0726	CULG				0046						IIIB,W
			CULG				0519		1				IIIB
			CULG				0526.5						IIIB,W
			CULG				0557		1				IIIB
	2026	2400	CULG				2202	2203	1				IIIG,U
19	0000	0726	CULG				0211.5	0214.5					IIIG,W
			CULG				0516	0520					IIIG,W
	2025	2400	CULG										
20	0000	0730	CULG										
	2025	2400	CULG										
21	0000	0725	CULG				0108.5						IIIB,W
	2025	2400	CULG										
22	0000	0730	CULG										
	2025	2400	CULG										
23	0000	0724	CULG										
	2024	2400	CULG										
24	0000	0724	CULG										
	2024	2400	CULG				2114						IIIB,W
25	0000	0724	CULG	0538.5	0539.5	1	0538	0540.5	2				IIIG,U

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

SEPTEMBER 1976

SEP 1976	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
25			CULG	0609.5	0610.5	1	0610	0611	2				IIIG,U
	2024	2400	CULG				2251	2251.5					IIIG,W
26	0000	0725	CULG				0042.5	0043.5	1				IIIG
			CULG				0046	0046.5					IIIG,W
			CULG				0048.5	0049					IIIG,W
	2033	2400	CULG				2023	2400	1				IIIN
			CULG				2128		1				IIIB
			CULG				2320		1				IIIG
27	0000	0723	CULG				0114	0119	1				IIIG
			CULG	0233	0233.5	1	0233	0234	1				IIIG
			CULG				0238		1				IIIB
			CULG				0433	0434	1				IIIG,U
			CULG	0436	0437	1	0436	0437	1				IIIG
			CULG				0559		1				IIIG
	2023	2400	CULG										
28	0000	0723	CULG				0031	0032					IIIG,W
			CULG				0056.5						IIIB,W
	2022	2400	CULG				2034.5	2400					IIIN,W
			CULG	2221	2221.5	1	2221	2222	2				IIIG
29	0000	0723	CULG				0000	0337					IIIN,W
			CULG				0002.5	0003	1	0002.5	0003	1	IIIG
			CULG				0115.5	0116	1	0115.5	0116	1	IIIG
			CULG				0336	0336.5	1	0336	0336.5	1	IIIG
	2022	2400	CULG				2105.5	2400					IIIN,W
30	0000	0722	CULG				0000	0722					IIIN,W
			CULG				0138	0143.5	2	0138	0143	1	IIIG
			CULG	0250	0415	1							I
			CULG				2021	2400					IS,W
	2200	2400	CULG				2200	2400	1				IIIN
			CULG				2325	2328	1	2325	2328	1	IIIGG
			CULG				2333	2337.5	1	2334	2337	1	IIIGG
			CULG				2349	2350	2	2349	2350	2	IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1976

OCT 1976	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01			CULG				0000	0722					IIIN,W
	0000	0722	CULG				0000	0100	1				I
			CULG	0424	0426	2	0424	0426.5	2	0424	0426.5	2	IIIGG,V
	2021	2400	CULG				2021	2400	1	2021	2157	1	IIIN
			CULG				2343		1				IIIB,U
02	0000	0722	CULG				0000	0722	1				IIIN
			CULG				0445	0722					IS,W
	2021	2400	CULG				2021	2400	1				IIIN
			CULG	2021	2200		2021	2400					IS,W
03	0000	0035	CULG				0000	0035	1				IIIN
			CULG				0000	0035					IS,W
	0122	0722	CULG				0122	0722	1				IIIN
			CULG				0122	0722					IS,W
	2022	2400	CULG				2022	2400					IIIN,W
			CULG				2022	2400	1				IS
04	0000	0721	CULG				0000	0721	1				IS
			CULG				0702						IIIB,W
	2020	2400	CULG				2253						IIIB,W
05	0000	0542	CULG				0041	0042					IIIG,W
			CULG				0448.5		1				IIIB
	0551	0721	CULG										
	2020	2400	CULG				2334	2335	1				IIIG
06	0000	0720	CULG				0704.5						IIIB,W
	2040	2400	CULG				2056.5						IIIB,W
			CULG				2120	2121	1				IIIG
07	0000	0720	CULG				0032.5	0033.5	1				IIIG,V,U
07			CULG				0133	0134	1				IIIG
			CULG				0304	0306	1				IIIG,U
			CULG				0442	0443	1				IIIG
	2020	2400	CULG				2021	2022					IIIG,W
08	0000	0719	CULG				0014	0017	1				IIIG,U
			CULG				0054	0055	2				IIIG,U
			CULG				0059	0100	2				IIIG,V,U
			CULG				0628	0629	1				IIIG
	2018	2400	CULG				2112.5						IIIB,W
			CULG				2306						IIIB,W
09	0000	0720	CULG				0112.5	0113	1				IIIG
			CULG				0213	0214	1				IIIG
			CULG				0521.5	0522.5	1				IIIG,U
			CULG				0524	0525	1				IIIG
	2020	2400	CULG										
10	0000	0448	CULG										
	2041	2400	CULG				2311		1				IIIB
11	0000	0719	CULG				0025	0026.5	1				IIIG
	2019	2400	CULG										
12	0000	0718	CULG				0029	0718					IIIN,W
			CULG				0139	0140.5	1				IIIG
			CULG				0257	0258	1				IIIG
			CULG				0403.5	0404.5	1				IIIG
			CULG				0406	0406.5	1				IIIG
			CULG				0412	0413	1				IIIG
			CULG				0438	0441	1				IIIGG
			CULG				0609	0610	1				IIIG
			CULG				0625		1				IIIB
			CULG				0646	0647	1				IIIG
			CULG				0651	0653	1				IIIG
	2018	2400	CULG				2101.5	2102					IIIG,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1976

OCT 1976	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
13	0000	0720	CULG										
			CULG				0647		1				IIIB
			CULG				0707	0709	1				IIIG
	2018	2400	CULG										
14	0000	0720	CULG	0133	0141		0134.5	0141	1				IIIGG
			CULG				0628		1				IIIB
	2018	2400	CULG				2032.5	2033					IIIG,W
15	0000	0718	CULG	0340	0341	1	0341	0342	1				UNCLF
16	0051	0718	CULG										
	2017	2400	CULG										
17	0000	0718	CULG										
	2017	2400	CULG										
18	0000	0717	CULG										
	2017	2400	CULG				2020.5	2021	1				IIIG
19	0000	0717	CULG										
	2017	2400	CULG										
			CULG				2037		1				IIIB
			CULG				2051		1				IIIB
20	0000	0717	CULG										
	2017	2400	CULG				2017	2017.5	1				IIIG,U
			CULG				2325						IIIB,W
21	0000	0717	CULG										
	2017	2400	CULG										
22	0000	0717	CULG				0342	0342.5	1	0342	0342.5	1	IIIG
22			CULG				2345						IIIB,W
23	0000	0716	CULG				0046.5						IIIB,W
			CULG				0848						IIIB,W
	2016	2400	CULG				2352.5						IIIB,W
24	0000	0716	CULG										
	2016	2400	CULG										
25	0000	0716	CULG				0500	0716					IS,W
			CULG				2016	2235					IIIN,W
	2016	2400	CULG	2016	2400	1	2016	2400	1				IS
26	0000	0716	CULG	0000	0716		0000	0716					IS,W
			CULG				0550	0716	1				IIIN
			CULG				2016	2400	1				IIIN
	2016	2400	CULG				2016	2400	1				IS
			CULG				2043	2044	2				IIIG,U
			CULG	2235.5	2236	1	2235.5	2236	1				IIIG,U
			CULG				2345		1				IIIB,U
27	0000	0716	CULG				0000	0716	1				IS
			CULG	0004	0716	1							IN
			CULG				0000	0310					IIIN,W
			CULG				2016	2400	1				IS
	2016	2400	CULG	2016	2120		2016	2400					IIIN,W
			CULG	2046	2046.5	1	2046	2046.5	1				IIIG,U
			CULG	2101	2102	1	2101	2102	1				IIIG
			CULG	2106	2107	1	2106	2107	1				IIIG
28	0000	0515	CULG				0000	0515	1				IIIN
			CULG				0000	0515					IS,W
			CULG				0104.5	0105.5	2				IIIG,U
			CULG	0133	0134	2	0133	0134	2				IIIG
			CULG	0140.5	0142.5	2	0140.5	0142.5	2				IIIGG
			CULG				0145.5		2				IIIB
			CULG				0201	0201.5	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1976

OCT 1976	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
			CULG	0620	0716	1	0620	0716	1				IIIN
	0620	0716	CULG				0620	0716					IS,W
			CULG				0624	0625	2				IIIG,U
			CULG	0627	0628	1	0627	0628	2				IIIG
			CULG				0633		2				IIIB
			CULG				0642	0644	2				IIIG
			CULG	0709	0709.5		0705.5	0710	2				IIIGG,V
	2016	2400	CULG				2016	2240	1				IS
			CULG				2016	2017	2				IIIG
			CULG	2016	2400		2016	2400	1				IIIN
			CULG				2047	2048	1				IIIG
			CULG	2056	2057		2056	2057	2				IIIG
			CULG				2103	2103.5	2				IIIG
			CULG				2122	2122.5	1				IIIG,U
			CULG	2136	2136.5		2132.5	2136.5	2				IIIGG,V,U
			CULG				2233	2234	2				IIIG
			CULG				2331	2331.5	2				IIIG
			CULG	2337	2339	1	2337	2339	2				IIIG
29	0000	0057	CULG	0000	0057	1	0000	0057	1				IIIN
			CULG				0016	0017	1				IIIG
			CULG				0022	0025	1				IIIGG,V
	0119	0716	CULG	0119	0716	1	0119	0716	1				IIIN
			CULG				0135	0138	1				IIIGG
			CULG	0140.5	0141.5	1	0140.5	0141.5	2				IIIG,V
			CULG	0148	0149	1							FAST DRIFT
			CULG	0150	0151	1	0159	0151	1				IIIG
			CULG	0233	0236	1	0231	0237	2				IIIGG,V,U
			CULG	0240.5	0241	1	0240	0242	3	0240.5	0241.5	2	IIIG,V
			CULG				0303	0304	1				IIIG
			CULG	0307	0311	1	0307	0311	1				IIIG
			CULG	0315	0317	1	0315.5	0317.5	1				IIIGG
			CULG				0336.5	0337	1				IIIG
29			CULG				0338	0339	1				IIIG
			CULG	0348	0349	1	0348	0349.5	2				IIIG,U
			CULG	0411	0416	1	0411	0416	1				IIIGG
			CULG				0508	0509	1				IIIG
			CULG	0651.5	0652	1	0651.5	0652	1				IIIG,U
	2016	2400	CULG	2016	2400	1	2016	2400	1				IIIN
			CULG	2051	2052	1	2051	2052	1				IIIB
			CULG				2055	2056	2				IIIG,V
			CULG				2119	2120.5	2	2119.5	2120	1	IIIG,V
			CULG				2145	2149	1				IIIG
			CULG	2156	2157	1	2156.5	2158	2				IIIG
			CULG	2204	2205	1	2204	2207	3	2204	2207	2	IIIGG,V,U
			CULG	2225	2235		2225	2400					IS,W
			CULG				2315	2317	2	2315	2317	1	IIIG,V
			CULG				2326		1				IIIB
30	0000	0716	CULG				0000	0716					IIIN,W
			CULG				0000	0716					IS,W
			CULG	0046	0046.5	1	0046	0046.5	2				IIIG
			CULG				0058	0059	1				IIIG
			CULG				0244	0247	1				IIIGG,U
			CULG				0258	0259	1				IIIG
			CULG				0306	0307	1				IIIG,U
			CULG	0321	0322.5		0320.5	0324.5	2	0321.5	0322.5	2	IIIGG,V
			CULG				0337	0338	1				IIIG
			CULG				0457	0458	1				IIIB,U
			CULG				0527	0528	1				IIIG
			CULG				0609		1				IIIB,U
			CULG				0645	0648	1				IIIG,U
			CULG				0711.5	0715.5	3	0712	0715.5	3	IIIGG,V
	2016	2400	CULG										
31	0000	0716	CULG				0301	0304	2	0301.5	0304.5	2	IIIG,V,U
	2016	2400	CULG										

UAG Series of Reports

Prepared by World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado, U.S.A.

These reports are for sale through the National Climatic Center, Federal Building, Asheville, NC 28801, Attn: Publications. Subscription price: $25.20 a year; $12.00 additional for foreign mailing; single copy price varies. These reports are issued on an irregular basis with 6 to 12 reports being issued each year. Therefore, in some years the single copy rate will be less than the subscription price, and in some years the single copy rate will be more than the subscription price. Make check or money order payable to: Department of Commerce, NOAA.

Some issues are now out of print and are available only on microfiche as indicated. Requests for microfiche should be sent to World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, CO 80302, with check or money order made payable to Department of Commerce, NOAA.

UAG-1 "IQSY Night Airglow Data", price $1.75.
UAG-2 "A Reevaluation of Solar Flares, 1964-1966", price 30 cents.
UAG-3 "Observations of Jupiter's Sporadic Radio Emission in the Range 7.6-41 MHz, 6 July 1966 through 8 September 1968", microfiche only, price 45 cents.
UAG-4 "Abbreviated Calendar Record 1966-1967", price $1.25.
UAG-5 "Data on Solar Event of May 23, 1967 and its Geophysical Effects", price 65 cents.

UAG-6 "International Geophysical Calendars 1957-1969", price 30 cents.
UAG-7 "Observations of the Solar Electron Corona: February 1964-January 1968", price 15 cents.
UAG-8 "Data on Solar-Geophysical Activity October 24-November 6, 1968", price (includes Parts 1 & 2) $1.75.
UAG-9 "Data on Cosmic Ray Event of November 18, 1968 and Associated Phenomena", price 55 cents.
UAG-10 "Atlas of Ionograms", price $1.50.

UAG-11 "Catalogue of Data on Solar-Terrestrial Physics" (now obsolete).
UAG-12 "Solar-Geophysical Activity Associated with the Major Geomagnetic Storm of March 8, 1970", price (includes Parts 1-3) $3.00.
UAG-13 "Data on the Solar Proton Event of November 2, 1969 through the Geomagnetic Storm of November 8-10, 1969, price 50 cents.
UAG-14 "An Experimental, Comprehensive Flare Index and Its Derivation for 'Major' Flares, 1955-1969", price 30 cents.
UAG-15 "Catalogue of Data on Solar-Terrestrial Physics" (now obsolete).

UAG-16 "Temporal Development of the Geographical Distribution of Auroral Absorption for 30 Substorm Events in each of IQSY (1964-65) and IASY (1969)", price 70 cents.
UAG-17 "Ionospheric Drift Velocity Measurements at Jicamarca, Peru (July 1967-March 1970)", microfiche only, price 45 cents.
UAG-18 "A Study of Polar Cap and Auroral Zone Magnetic Variations", price 20 cents.
UAG-19 "Reevaluation of Solar Flares 1967", price 15 cents.
UAG-20 "Catalogue of Data on Solar-Terrestrial Physics" (now obsolete).

UAG-21 "Preliminary Compilation of Data for Retrospective World Interval July 26 - August 14, 1972", price 70 cents.
UAG-22 "Auroral Electrojet Magnetic Activity Indices (AE) for 1970", price 75 cents.
UAG-23 "U.R.S.I. Handbook of Ionogram Interpretation and Reduction", price $1.75.
UAG-24 "Data on Solar-Geophysical Activity Associated with the Major Ground Level Cosmic Ray Events of 24 January and 1 September 1971", price (includes Parts 1 and 2) $2.00.
UAG-25 "Observations of Jupiter's Sporadic Radio Emission in the Range 7.6-41 MHz, 9 September 1968 through 9 December 1971", price 35 cents.

UAG-26 "Data Compilation for the Magnetospherically Quiet Periods February 19-23 and November 29 - December 3, 1970", price 70 cents.
UAG-27 "High Speed Streams in the Solar Wind", price 15 cents.
UAG-28 "Collected Data Reports on August 1972 Solar-Terrestrial Events", price (includes Parts 1-3) $4.50.
UAG-29 "Auroral Electrojet Magnetic Activity Indices AE (11) for 1968", price 75 cents.
UAG-30 "Catalogue of Data on Solar-Terrestrial Physics", price $1.75.

UAG-31 "Auroral Electrojet Magnetic Activity Indices AE (11) for 1969", price 75 cents.
UAG-32 "Synoptic Radio Maps of the Sun at 3.3 mm for the Years 1967-1969", price 35 cents.
UAG-33 "Auroral Electrojet Magnetic Activity Indices AE (10) for 1967", price 75 cents.
UAG-34 "Absorption Data for the IGY/IGC and IQSY", price $2.00.
UAG-35 "Catalogue of Digital Geomagnetic Variation Data at World Data Center A for Solar-Terrestrial Physics", price 20 cents.

UAG-36 "An Atlas of Extreme Ultraviolet Flashes of Solar Flares Observed Via Sudden Frequency Deviations During the ATM-SKYLAB Missions", price 55 cents.
UAG-37 "Auroral Electrojet Magnetic Activity Indices AE (10) for 1966", price 75 cents.
UAG-38 "Master Station List for Solar-Terrestrial Physics Data at WDC-A for Solar-Terrestrial Physics", price $1.60.
UAG-39 "Auroral Electrojet Magnetic Activity Indices AE (11) for 1971", by Joe Haskell Allen, Carl C. Abston and Leslie D. Morris, National Geophysical and Solar-Terrestrial Data Center, Environmental Data Service, February 1975, 144 pages, price $2.05.

UAG-40 "H-Alpha Synoptic Charts of Solar Activity For the Period of Skylab Observations, May, 1973-March, 1974", by Patrick S. McIntosh, NOAA Environmental Research Laboratory, February 1975, 32 pages, price 56 cents.

UAG-41 "H-Alpha Synoptic Charts of Solar Activity During the First Year of Solar Cycle 20, October, 1964 - August, 1965", by Patrick S. McIntosh, NOAA Environmental Research Laboratory, and Jerome T. Nolte, American Science and Engineering, Cambridge, Massachusetts, March 1975, 25 pages, price 48 cents.

UAG-42 "Observations of Jupiter's Sporadic Radio Emission in the Range 7.6-80 MHz 10 December 1971 through 21 March 1975", by James W. Warwick, George A. Dulk, and Anthony C. Riddle, Department of Astro-Geophysics, University of Colorado, Boulder, Colorado 80302, April 1975, 49 pages, price $1.15.

UAG-43 "Catalog of Observation Times of Ground-Based Skylab-Coordinated Solar Observing Programs", compiled by Helen E. Coffey, World Data Center A for Solar-Terrestrial Physics, May 1975, 159 pages, price $3.00.

UAG-44 "Synoptic Maps of Solar 9.1 cm Microwave Emission from June 1962 to August 1973", by Werner Graf and Ronald N. Bracewell, Radio Astronomy Institute, Stanford University, Stanford, California 94305, May 1975, 183 pages, price $2.55.

UAG-45 "Auroral Electrojet Magnetic Activity Indices AE (11) for 1972", by Joe Haskell Allen, Carl C. Abston and Leslie D. Morris, National Geophysical and Solar-Terrestrial Data Center, Environmental Data Service, May 1975, 144 pages, price $2.10.

UAG-46 "Interplanetary Magnetic Field Data 1963-1974", by Joseph H. King, National Space Science Data Center, NASA Goddard Space Flight Center, Greenbelt, Maryland 20771, June 1975, 382 pages, price $2.95.

UAG-47 "Auroral Electrojet Magnetic Activity Indices AE (11) for 1973", by Joe Haskell Allen, Carl C. Abston and Leslie D. Morris, National Geophysical and Solar-Terrestrial Data Center, Environmental Data Service, June 1975, 144 pages, price $2.10.

UAG-48A "Synoptic Observations of the Solar Corona during Carrington Rotations 1580-1596 (11 October 1971 - 15 January 1973)", [Reissue with quality images] by R. A. Howard, M. J. Koomen, D. J. Michels, R. Tousey, C. R. Detwiler, D. E. Roberts, R. T. Seal and J. D. Whitney, E. O. Hulbert Center for Space Research, NRL, Washington, D. C. 20375 and R. T. and S. F. Hansen, C. J. Garcia and E. Yasukawa, High Altitude Observatory, NCAR, Boulder, Colorado 80303, February 1976, 200 pages, price $4.27.

UAG-49 "Catalog of Standard Geomagnetic Variation Data", prepared by Environmental Data Service, NOAA, Boulder, Colorado, August 1975, 125 pages, price $1.85.

UAG-50 "High-Latitude Supplement to the URSI Handbook on Ionogram Interpretation and Reduction", by W. R. Piggott, British Antarctic Survey, c/o SRC, Appleton Laboratory, Ditton Park, Slough, England, October 1975, 292 pages, price $4.00.

UAG-51 "Synoptic Maps of Solar Coronal Hole Boundaries Derived from He II 304Å Spectroheliograms from the Manned Skylab Missions", by J. D. Bohlin and D. M. Rubenstein, E. O. Hulbert Center for Space Research, Naval Research Laboratory, Washington, D. C. 20375 U.S.A., November 1975, 30 pages, price 54 cents.

UAG-52 "Experimental Comprehensive Solar Flare Indices for Certain Flares, 1970-1974", compiled by Helen W. Dodson and E. Ruth Hedeman, McMath-Hulbert Observatory, The University of Michigan, 895 Lake Angelus Road North, Pontiac, Michigan 48055 U.S.A., November 1975, 27 pages, price 60 cents.

UAG-53 "Description and Catalog of Ionospheric F-Region Data, Jicamarca Radar Observatory (November 1966 - April 1969)", by W. L. Clark and T. E. Van Zandt, Aeronomy Laboratory, NOAA, Boulder, Colorado 80302 and J. P. McClure, University of Texas at Dallas, Dallas, Texas 75230, April 1976, 10 pages, price 33 cents.

UAG-54 "Catalog of Ionosphere Vertical Soundings Data", prepared by Environmental Data Service, NOAA, Boulder, Colorado 80302, April 1976, 130 pages, price $2.10.

UAG-55 "Equivalent Ionospheric Current Representations by a New Method, Illustrated for 8-9 November 1969 Magnetic Disturbances", by Y. Kamide, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Colorado 80302 and Geophysical Institute, University of Alaska, Fairbanks, Alaska 99701, H. W. Kroehl, Data Studies Division, NOAA/EDS/NGSDC, Boulder, Colorado 80302, M. Kanamitsu, Advanced Study Program, National Center for Atmospheric Research, Boulder, Colorado 80303, J. H. Allen, Data Studies Division, NOAA/EDS/NGSDC, Boulder, Colorado 80302, and S.-I. Akasofu, Geophysical Institute, University of Alaska, Fairbanks, Alaska 99701, April 1976, 91 pages, price $1.60.

UAG-56 "Iso-intensity Contours of Ground Magnetic H Perturbations for the December 16-18, 1971 Geomagnetic Storm", by Y. Kamide, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Colorado 80302 and Geophysical Institute, University of Alaska, Fairbanks, Alaska 99701 (currently Guest worker at Data Studies Division, NOAA/EDS/NGSDC, Boulder, Colorado 80302), April 1976, 37 pages, price $1.39.

UAG-57 "Manual on Ionospheric Absorption Measurements", edited by K. Rawer, Institut für Physikalische Weltraumforschung, Freiburg, G.F.R., June 1976, 202 pages, price $4.27.

UAG-58 "ATS6 Radio Beacon Electron Content Measurements at Boulder, July 1974 - May 1975", by R. B. Fritz, Space Environment Laboratory (currently with Wave Propagation Laboratory), NOAA, Boulder, Colorado 80301 USA, September 1976, 61 pages, price $1.04.

UAG-59 "Auroral Electrojet Magnetic Activity Indices AE(11) for 1974", by Joe Haskell Allen, Carl C. Abston and Leslie D. Morris, National Geophysical and Solar-Terrestrial Data Center, Environmental Data Service, December 1976, 144 pages, price $2.16.

USCOMM-NOAA-ASHEVILLE--1-77--950